AdvisoryWorld

ICE and related Plug-in Modules

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ACCESSING THE ICE APPLICATION
Select "**ICE**"

Select "**ICE Professional Java Free**"
*There is no real functional difference between the two entry points. "Java Free" is typically a more user friendly and firewall friendly location.

Enter your Username and Password

TECHNICAL SUPPORT FOR ICE

* In order for ICE to work properly on your machine you must ensure that you have both the Sun and Microsoft Java Virtual Engines Installed.
You must also set your Internet Explorer settings to allow for ActiveX commands.

Please follow these steps:

1. Update both Microsoft and Sun Java Virtual Machine
2. Internet Explorer ActiveX Settings
3. Internet Explorer Temporary Settings
4. The ICE software has been designed to run on the Microsoft Internet Explorer version 5.0 or newer.

UPDATE JAVA AND MICROSOFT VIRTUAL MACHINES

- **Title:** Java Runtime Environment Download
  Product: ICE
  Description: Download and Install the Sun JavaTM Virtual Machine (JVM) There are two ways to get Sun's JVM:

  1) Automatic Download and Installation - (for Windows XP, Me, NT, 2000, 98, or 95 and Internet Explorer)
  Click to begin: First, our system will check to see if automatic install works on your computer...
  If so, the automatic process previewed here will begin. If not, you will see how to manually download and install, which is nearly as quick and easy as automatic installation.

  2) Manual Download for Later Installation - Advanced users may want to download a local copy of the installer from our developer Web site to run at a later time or install on other machines. The manual download is referred to as the Java 2 Runtime Environment (JRE).

- **Title:** Microsoft Java (VM)Virtual Machine
  Product: ICE
  Description: A note about Microsoft Java Virtual Machine as of May 18, 1999

  The Microsoft Windows Update site may have newer installations for Windows that contain this software.
  http://windowsupdate.microsoft.com/

  You will need to also install a browser component called the Microsoft Java Virtual Machine.
  It is a file supplied by Microsoft and can be downloaded from their servers. Click on the link above to download it. It is 5.21MB in size.

  When the dialogue box opens, chose "**Open**" if that is an option.
  If that is not an option, choose to save the file in "My Documents". After it is saved double click on that file in "My Documents".

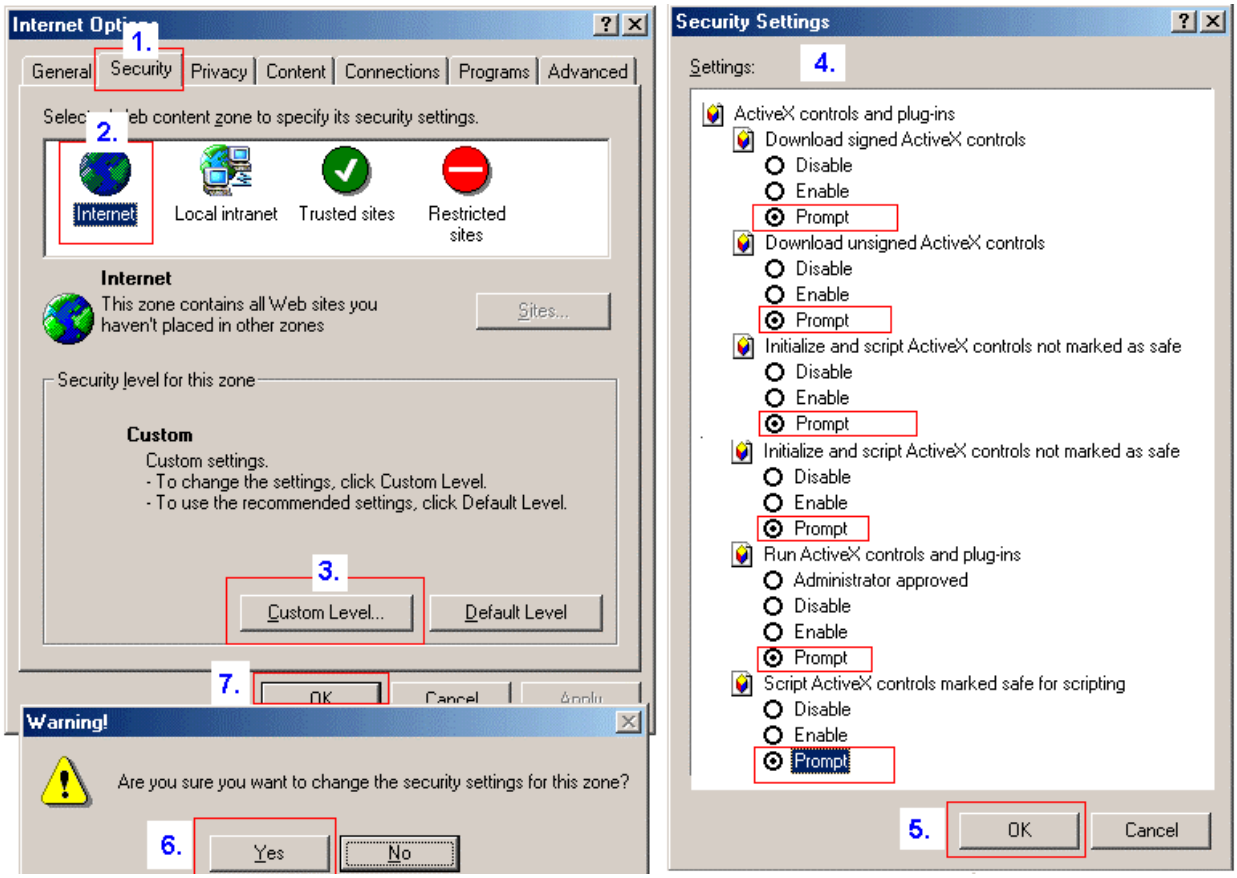
The name of the file is:
MSJavx86_CD24D109B33421DB6728FBDC80C9F572EB7A3865.exe
After you run the program, follow the instructions to install the Microsoft Java Virtual Machine component on your computer.
You will need to restart your computer after the install.

INTERNET EXPLORER ACTIVEX SETTINGS

- **Title:** Internet Explorer ActiveX
  Product: ICE
  Description: Edit the Active X settings in Internet Explorer to allow ICE to function better.

  Click on Tools and Click on Internet Options.

  1. Click on the Security Tab
  2. Click on Internet
  3. Click on Custom Level
  4. Enabled ActiveX settings?
     Leave them Enabled.
     Disabled ActiveX settings? Click on Prompt.
  5. When completed click on the OK button
  6. Click on YES to the Security changes.
  7. Click on OK to close the Internet Options.



INTERNET EXPLORER TEMPORARY INTERNET FILE SETTINGS

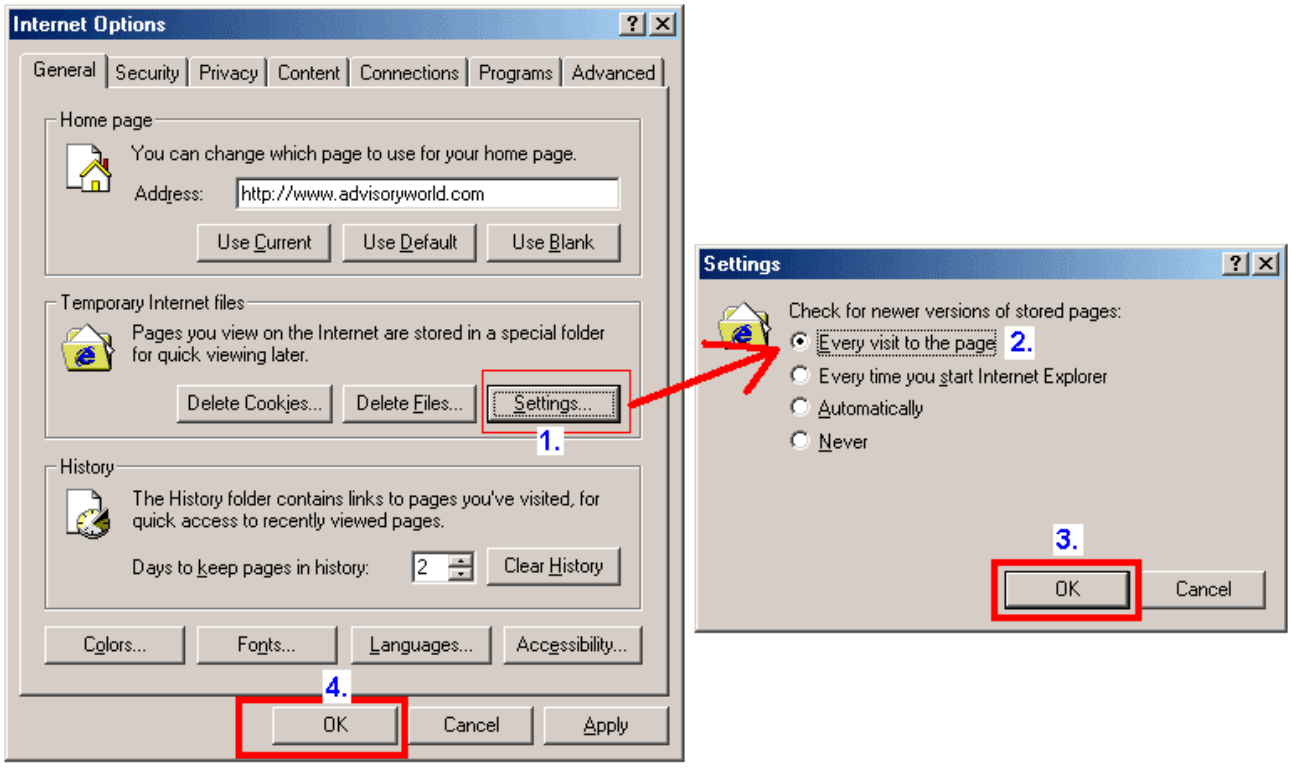
- **Title:** Internet Explorer Temporary Internet Files and Temporary Pages
  Product: ICE
  Description: Edit the settings to "delete the temporary files" and edit settings.

  To Delete the Temporary Internet Files:

  1. Click on Tools and Internet Options.
  2. Click on Delete Files...
  3. Click on Yes
  4. Click on OK to close the "Internet Options".

  To edit the Temporary Settings.

  1. Click on Tools and Internet Options.
  2. Click on Settings.
  3. Click on "Every visit to the page"
  4. Click on OK
  5. Click on OK to close the "Internet Options".



VECTOR GRAPHICS

If you do not have Microsoft's Vector Graphics tools loaded, you should download these tools from the Microsoft web site before running the application.
If you have any questions regarding the **ICE application or any of its Plug-ins**, please contact:

TECHNICAL SUPPORT **(818) 999-0015**
FAX **(818) 304-0722**

HELP SCREENS:

All operations and functions within the programs are fully explained in the **Help** screens.

Directions on how to use the programs and all of the program functions may be found in the "Help" files. You will also find definitions, explanations of terms and functions, marketing ideas, a "slide show" for education and client presentations and many other useful hints.

To access the "Help" files, simply click on "Help" at the top of the command bar.

"HOW TO" VIEWLETS

The "viewlets" below will help you learn how to use various functions in the ICE application.

- What is ICE?
- Using Goal Based Optimization in ICE
- How to Import data to ICE from Ramcap or Power Optimizer
- How to use ICE Monte Carlo
- How to build a portfolio using ICE

Instructional Series

SEVERAL INSTRUCTIONAL WHITE PAPERS CAN BE FOUND ON THE ICE PAGE AT WWW.ADVISORYWORLD.COM. THESE INFORMATIVE PAMPHLETS WILL WALK YOU THROUGH SPECIFIC TOPICS STEP-BY-STEP.

ICE – GETTING STARTED & CASE STUDY

OPENING THE ICE APPLICATION

To access Advisoryworld's ICE application simply click here (http://www.ice.advisoryworld.com/ice) or add this URL to your Favorites folder on your Internet browser.

Enter your Username and Password (or Username: Test and Password: Demo for Read-only trial)

Advisor Setup

***Click on** Advisor Setup*

Enter Information about the advisor (yourself) including contact info and standard advisor fees. When finished here click on OK.

JOHN T. SMITH ICE CASE STUDY

John Smith is 50 years old. John has an existing retirement portfolio worth $250,000 and consisting of several mutual funds. John plans on contributing $500 a month to this portfolio and hopes to retire when he turns 60, withdrawing $42,000 per year after that. Will he be able to do so with his current positions?
If not, what is an appropriate recommendation?

Contact info:

Social Security: 987654321
D.O.B.: 03/25/1952
Address: 3500 Lawndale Drive, Suite 101
Los Angeles, CA 90015
Office Phone: (818) 991-0014
Home Phone: (818) 905-5040
Fax: (818) 714-0031
Email: john@smith.com
Employer: Acme Co.
Bank: Washington Mutual

Account Info:

Account Type: Personal Investment
Account Title: John Smith's Retirement
Account # : 411
Objective: Growth & Income
Brokerage Firm: Advantage Limited

Portfolio Info:

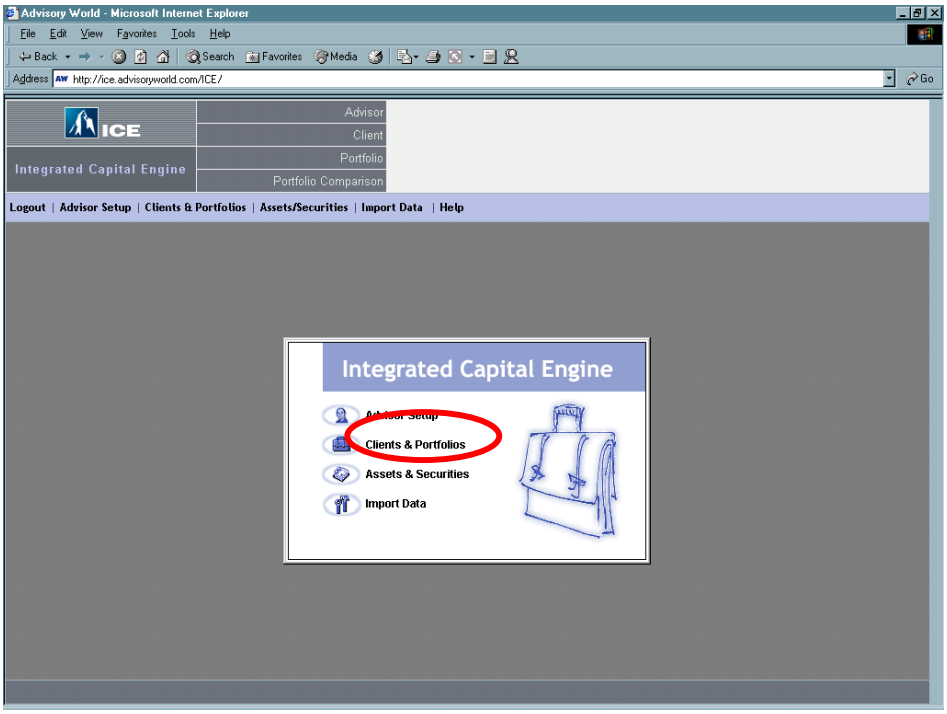
Name: John Current
Objective: Retirement
Value: $250,000
Status: Current

Portfolio Composition:

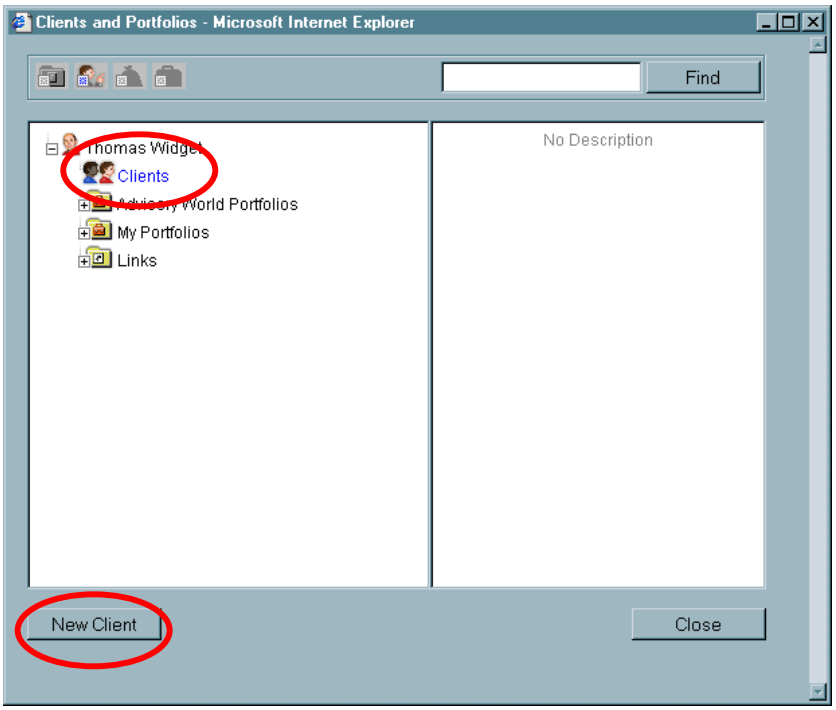
Ticker	Name	Dollar Value
LCBAX	AIM Large Cap Basic Value A	15,000
MSVTX	MFS Strategic Value A	5,000
LCGAX	AIM Large Cap Growth A	25,000
ABHIX	American Century High-Yield Investor	20,000
OPIGX	Oppenheimer Bond Fund A	35,000
DFSVX	DFA Small Cap Value A	7,500
XSFRX	Liberty Floating Rate Advantage A	100,000
FGEAX	Fidelity Advantage Global Equity A	22,500
MEMAX	MFS Emerging Market Equity Fund A	15,000
Total		**$250,000**

To open your clients list and portfolios
Click On **Clients & Portfolios**
This has been designed in the same hierarchical format as Windows Explorer.

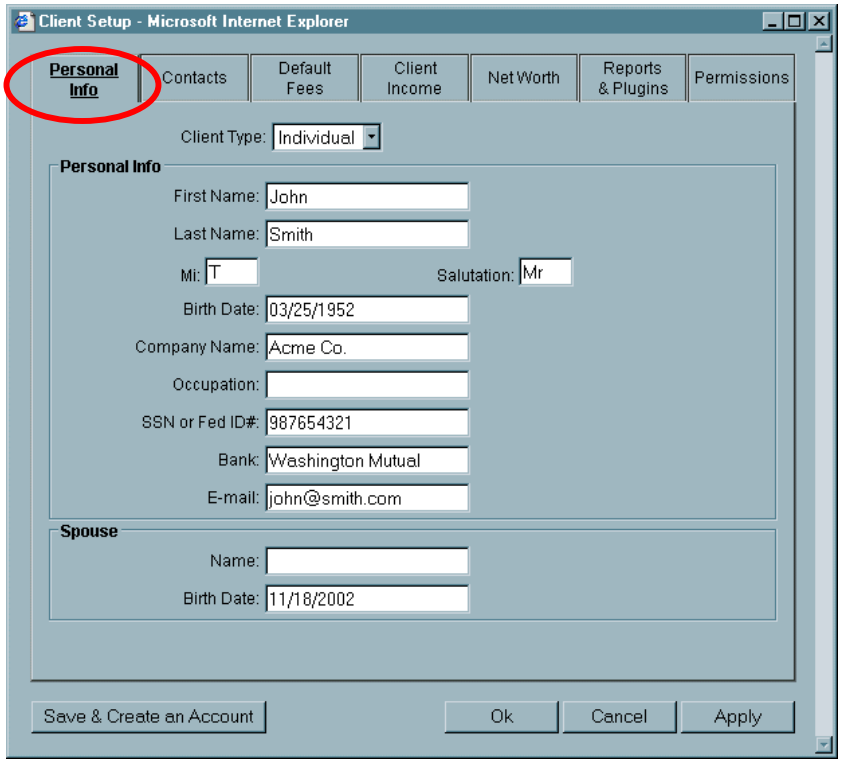
Advisor	– Advisor Information
Clients	– Click here to begin entering clients
Accounts	- Click on your choice of accounts
Portfolios	- Click on your choice of portfolios
AdvisoryWorld Portfolios	- A set of portfolios designed for different risk tolerance
My Portfolios	– This is where users design predefined portfolios
Links	– Allows users to group clients in relation to Portfolio Value etc.



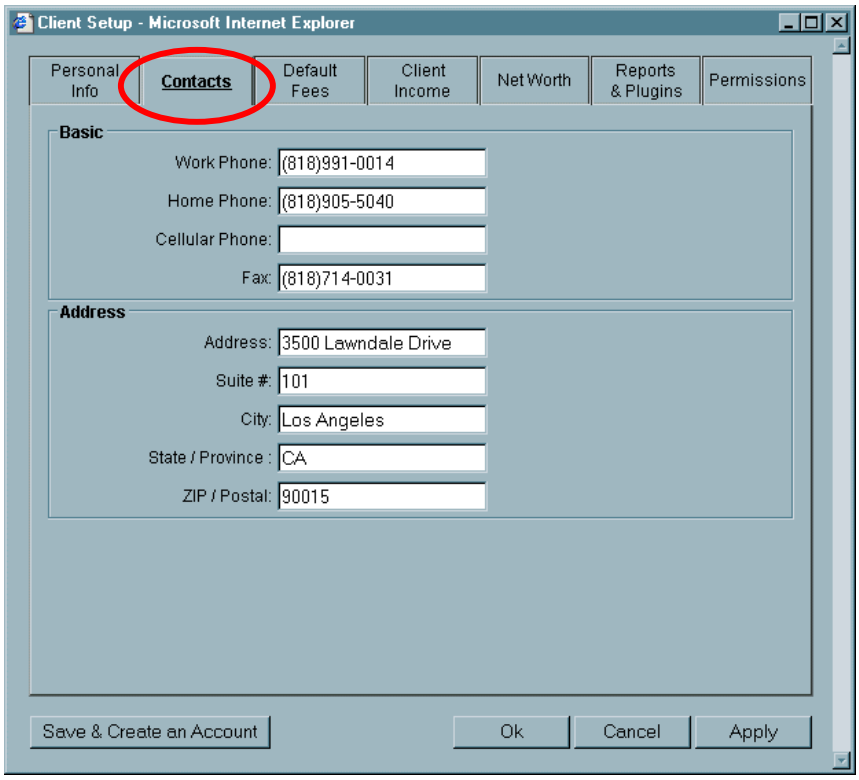
Next select a Client in the Clients Folder (The word Client will be highlighted in blue) and then click on New Client on the lower left quadrant of that window. The Client Setup Screen will pop-up.



New Clients
Enter required fields as well as details such as client income and net worth.
You must always enter a client first and last name as well as a Social Security number.



Click on the Contacts Tab and enter Contact Info.



Reports & Plugins

If you have permission to allow clients to review reports, select those reports that you will allow this client to review.

Permissions

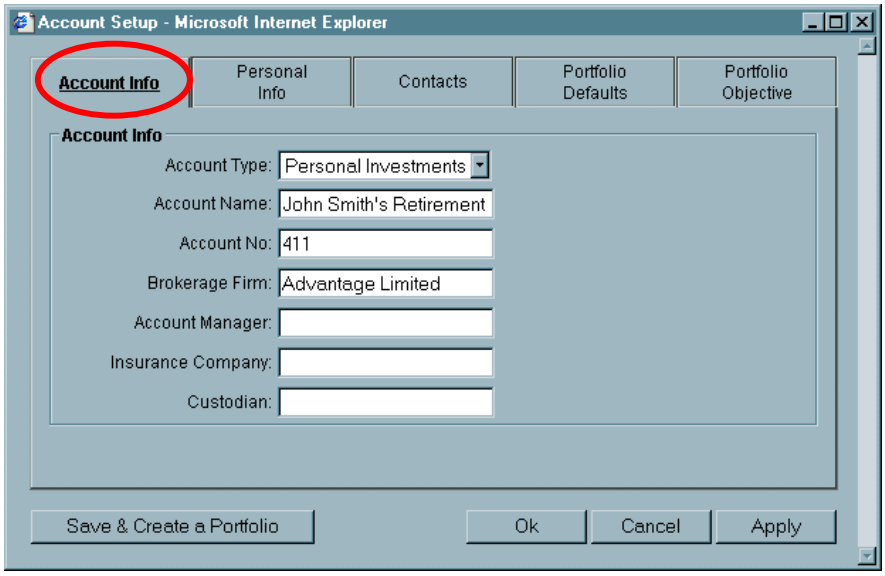
If you have permission to allow clients to review reports, enter a read-only Username and Password that the client will use to access and review reports.

Click on ***Save and Create an Account*** (bottom of page)

New Accounts

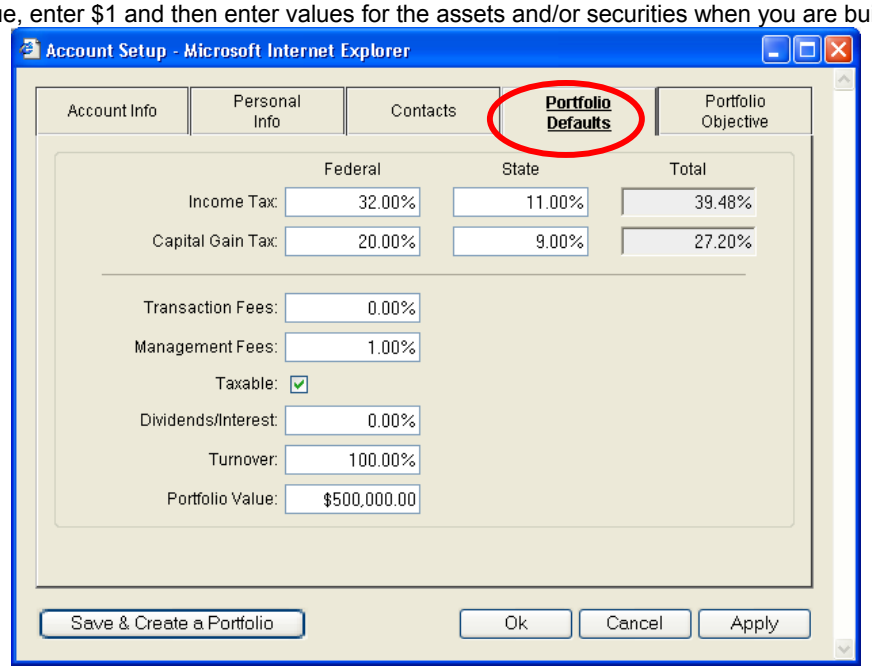
Enter General Account Information

Select an account type (Personal, IRA, SEP, etc.)



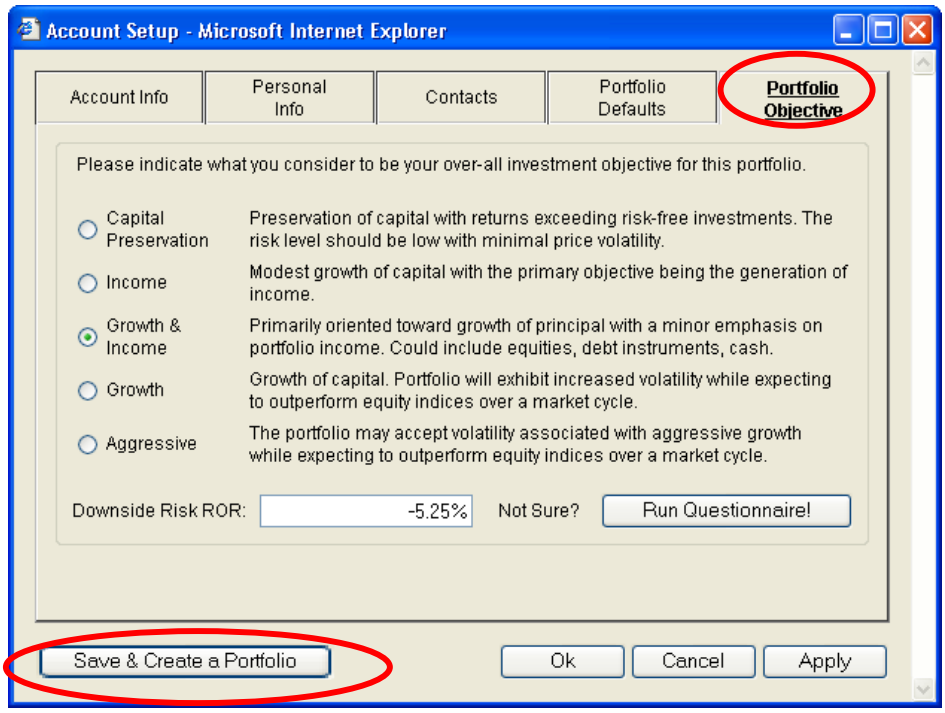
Portfolio Defaults

If this account or portfolio is taxable, enter the Federal and State tax rates for income and capital gains. Check the "Taxable" box if it is taxable and leave blank if not. The "Turnover Rate" is the percentage of portfolio holdings that will be bought and sold within any 12 months period. For example, if only 50% of all portfolio securities will be bought and sold within any12 month period, then set the "Turnover Rate" at 50%. In the Portfolio Builder screen you will have an opportunity to set the taxability of each security as well as set Transaction and Management Fees, Turnover Rates, Dividends/Interest for each security. If you do not know the portfolio value, enter $1 and then enter values for the assets and/or securities when you are building the portfolio.



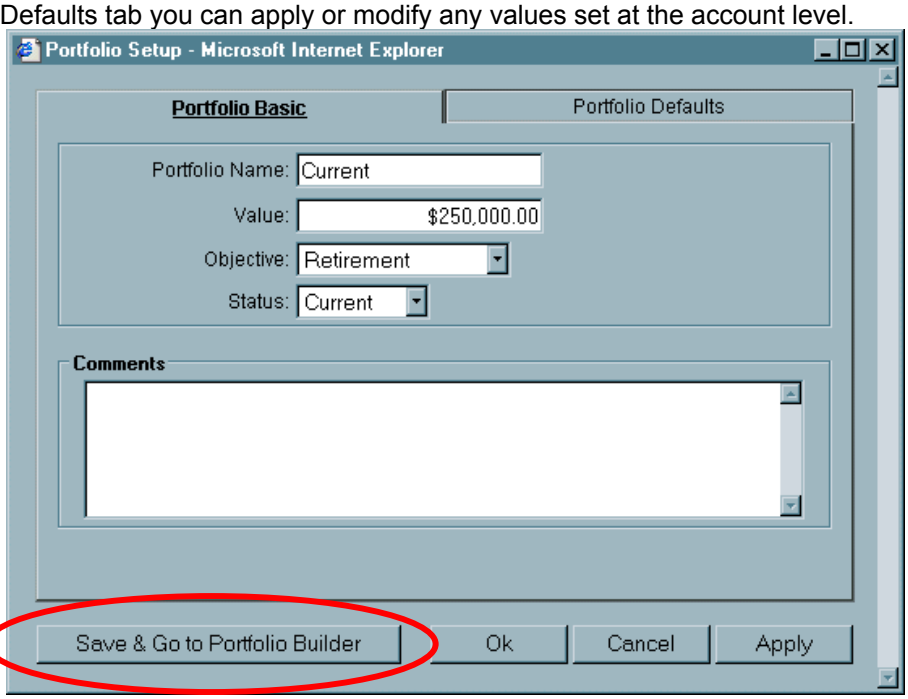
Portfolio Objective

The Portfolio Objective tab is where you will determine and select the appropriate Risk Tolerance level for your client. Pick from one of the 5 investment objectives. Each objective defaults to a downside Risk ROR(Rate of Return). This number relates to the maximum real or nominal loss your client is willing to take in any 12-month period in order to reach his/her goals. If you are not sure which category your client fits into, simply run the Risk Profile Questionnaire that will result in a selection of 1 of the 5 categories. This questionnaire can be printed & emailed.


Account Setup - Microsoft Internet Explorer
Account Info
Personal Info
Contacts
Portfolio Defaults
Portfolio Objective
Please indicate what you consider to be your over-all investment objective for this portfolio.
Capital Preservation
Preservation of capital with returns exceeding risk-free investments. The risk level should be low with minimal price volatility.
Income
Modest growth of capital with the primary objective being the generation of income.
Growth & Income
Primarily oriented toward growth of principal with a minor emphasis on portfolio income. Could include equities, debt instruments, cash.
Growth
Growth of capital. Portfolio will exhibit increased volatility while expecting to outperform equity indices over a market cycle.
Aggressive
The portfolio may accept volatility associated with aggressive growth while expecting to outperform equity indices over a market cycle.
Downside Risk ROR:
-5.25%
Not Sure?
Run Questionnaire!
Save & Create a Portfolio
Ok
Cancel
Apply

Click on **Save and Create a Portfolio** (bottom of page)

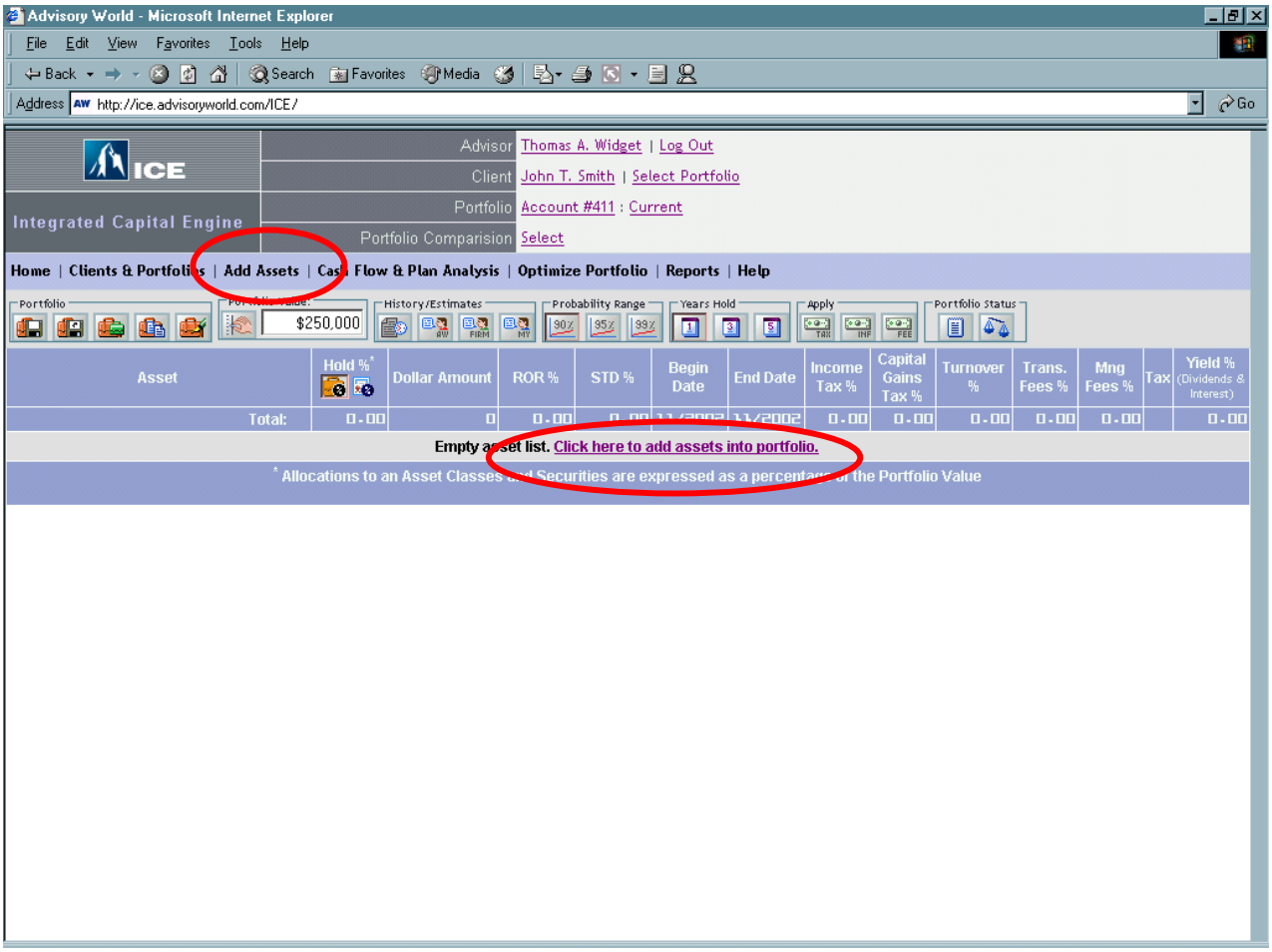
New Portfolios
Enter Portfolio name and value as well as status (Current, Proposed, Testing)
Using the Portfolio Defaults tab you can apply or modify any values set at the account level.



Click on **Save and Go to Portfolio Builder** (bottom of page)

BUILDING PORTFOLIOS

Portfolio Builder
The Portfolio Builder page is the hub of your ICE application. When you reach this page simply press **Click here to add assets into portfolio** or Add Assets.



Adding Assets & Securities
The 'Assets & Securities: Add, Remove, Classify' window appears on top. The left pane of this window displays the list of available Assets/Securities. In the right pane, you see those Assets/Securities that are already present in the portfolio (blank if using for the first time).

You can add assets by selecting an asset/security in the left dialog's pane and double clicking on that security, by clicking on the 'Add' button or by Searching for securities by ticker symbol.

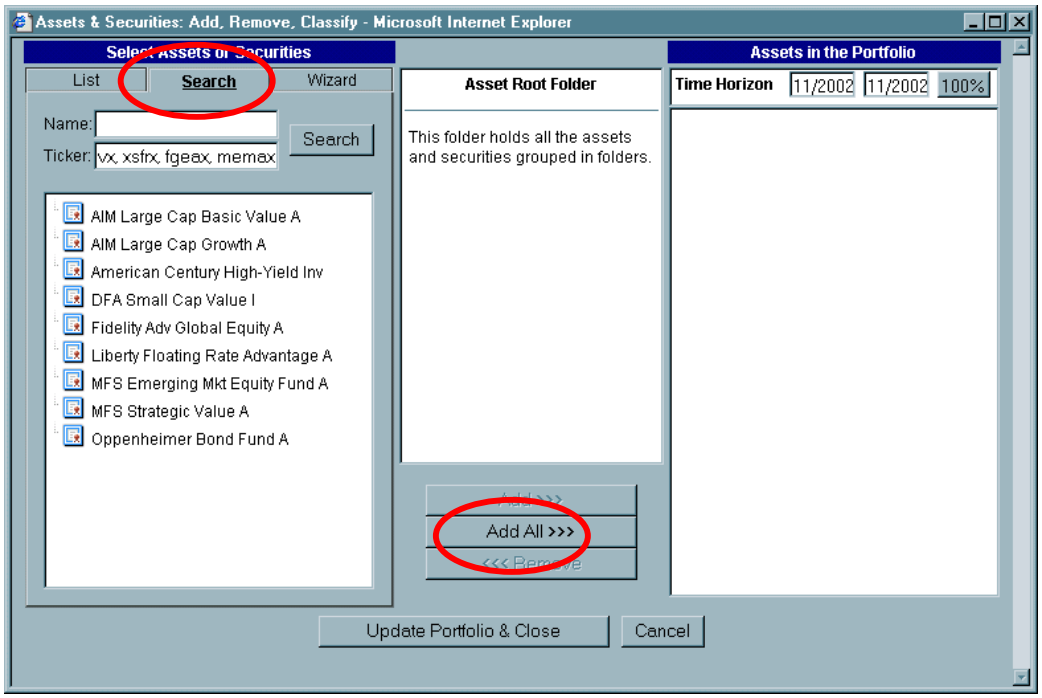
To remove an asset/security from the portfolio select it in the right pane and click on the 'Remove' button.
An asset class is added to the portfolio under the asset type to which it has been assigned in the Assets/Securities dialog (See also Classifying asset classes). You can also move by drag-n-drop an asset class to another asset type within the portfolio (in the dialog's right panel).

When adding a security, you will be prompted to choose between those asset classes defined for this security by AW, Firm or you personally. If only one was defined, it will be automatically used. If no classes were defined for the security, you will be prompted to choose between the asset classes available in the portfolio. A security can be moved by drag-n-drop to another asset class within any given portfolio (in the dialog's right panel).

When the Add Assets window pops up, simply click on the Search tab. In the Ticker cell, enter Mutual Fund ticker symbols separated by commas and then press Search.

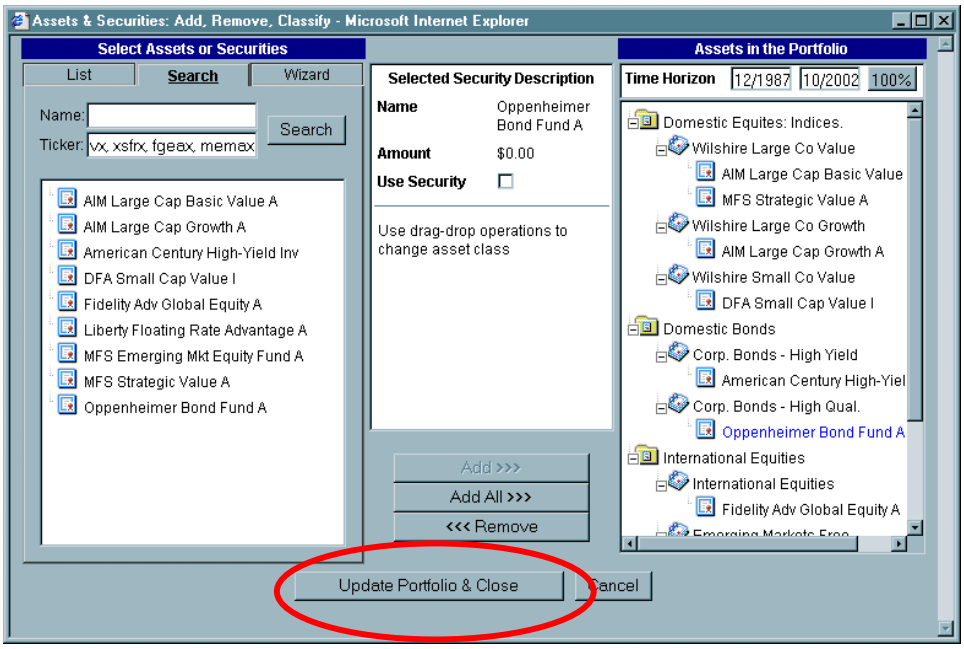
LCBAX,MSVTX,LCGAX,DFSVX,ABHIX,OPIGX,FGEAX,MEMAX,XSFRX

After the list of funds is shown, press Add All.



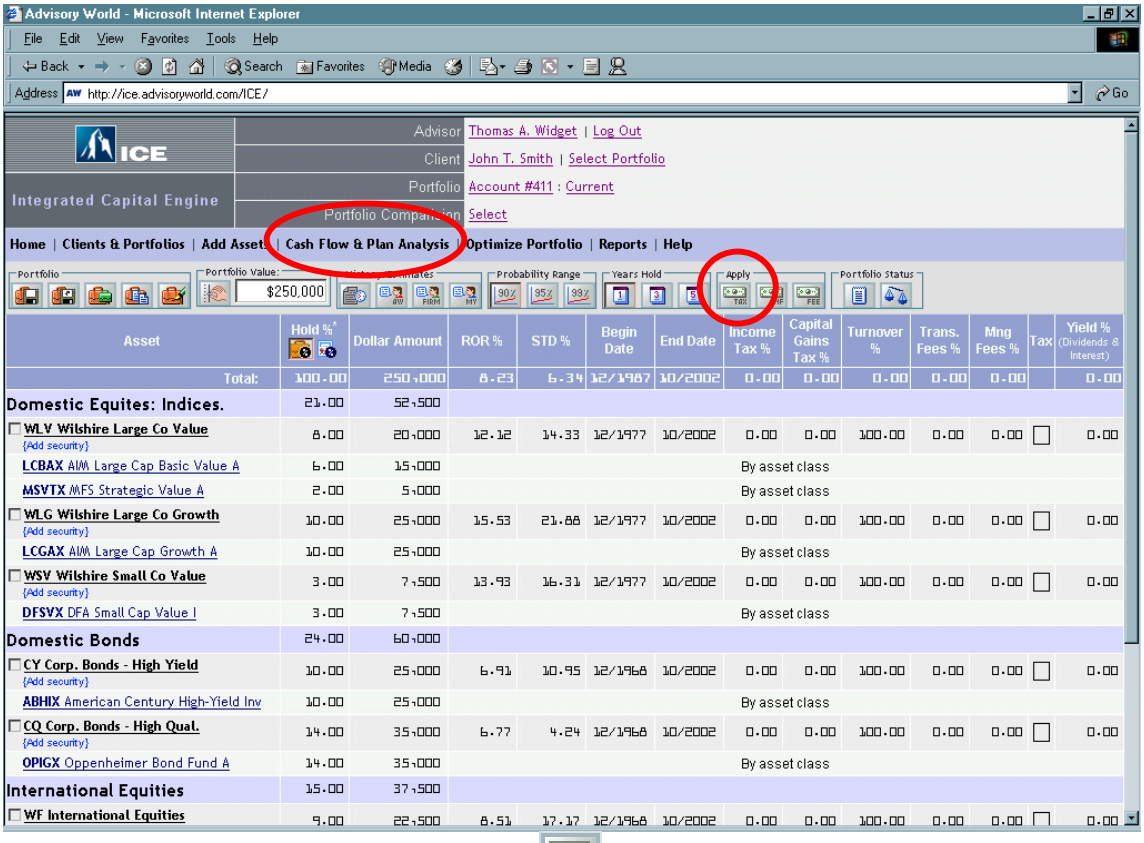
ICE automatically classifies all of the Mutual Funds. These can be edited but for this case let's leave them as is. Choose **Add to Portfolio**.

The following screen will be displayed. Press **Update Portfolio and Close**.



For more information on adding assets and setting time horizons, see A General Overview of ICE Functions.

Now your Portfolio Builder screen will contain all of the Assets in your portfolio. On the left side of your screen you will see small gray buttons with plus signs on them. Double-click on these buttons and your Mutual Funds will become visible. Click in the cells under the Dollar Amount column and next to each of the mutual funds. Enter their appropriate values. For more information about this screen, see A General Overview of ICE Functions.


Advisory World - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://ice.advisoryworld.com/ICE/
ICE
Integrated Capital Engine
Advisor Thomas A. Widget | Log Out
Client John T. Smith | Select Portfolio
Portfolio Account #411 : Current
Portfolio Comparison Select
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help
Portfolio Value: $250,000
Asset
Hold %
Dollar Amount
ROR %
STD %
Begin Date
End Date
Income Tax %
Capital Gains Tax %
Turnover %
Trans. Fees %
Mng Fees %
Tax
Yield % (Dividends & Interest)
Total: 100.00 250,000 8.23 6.34 12/1987 10/2002 0.00 0.00 0.00 0.00 0.00 0.00
Domestic Equites: Indices. 21.00 52,500
WLV Wilshire Large Co Value 8.00 20,000 12.12 14.33 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
LCBAX AIM Large Cap Basic Value A 6.00 15,000 By asset class
MSVTX MFS Strategic Value A 2.00 5,000 By asset class
WLG Wilshire Large Co Growth 10.00 25,000 15.53 21.88 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
LCGAX AIM Large Cap Growth A 10.00 25,000 By asset class
WSV Wilshire Small Co Value 3.00 7,500 13.93 16.31 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
DFSVX DFA Small Cap Value I 3.00 7,500 By asset class
Domestic Bonds 24.00 60,000
CY Corp. Bonds - High Yield 10.00 25,000 6.91 10.95 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
ABHIX American Century High-Yield Inv 10.00 25,000 By asset class
CQ Corp. Bonds - High Qual. 14.00 35,000 6.77 4.24 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
OPIGX Oppenheimer Bond Fund A 14.00 35,000 By asset class
International Equities 15.00 37,500
WF International Equities 9.00 22,500 8.51 17.17 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00

After Entering the Dollar Values, click on the Taxes Icon

to apply taxes to the portfolio. Taxes, Fees and Inflation can be turned on or off at any time simply by clicking on the icons.

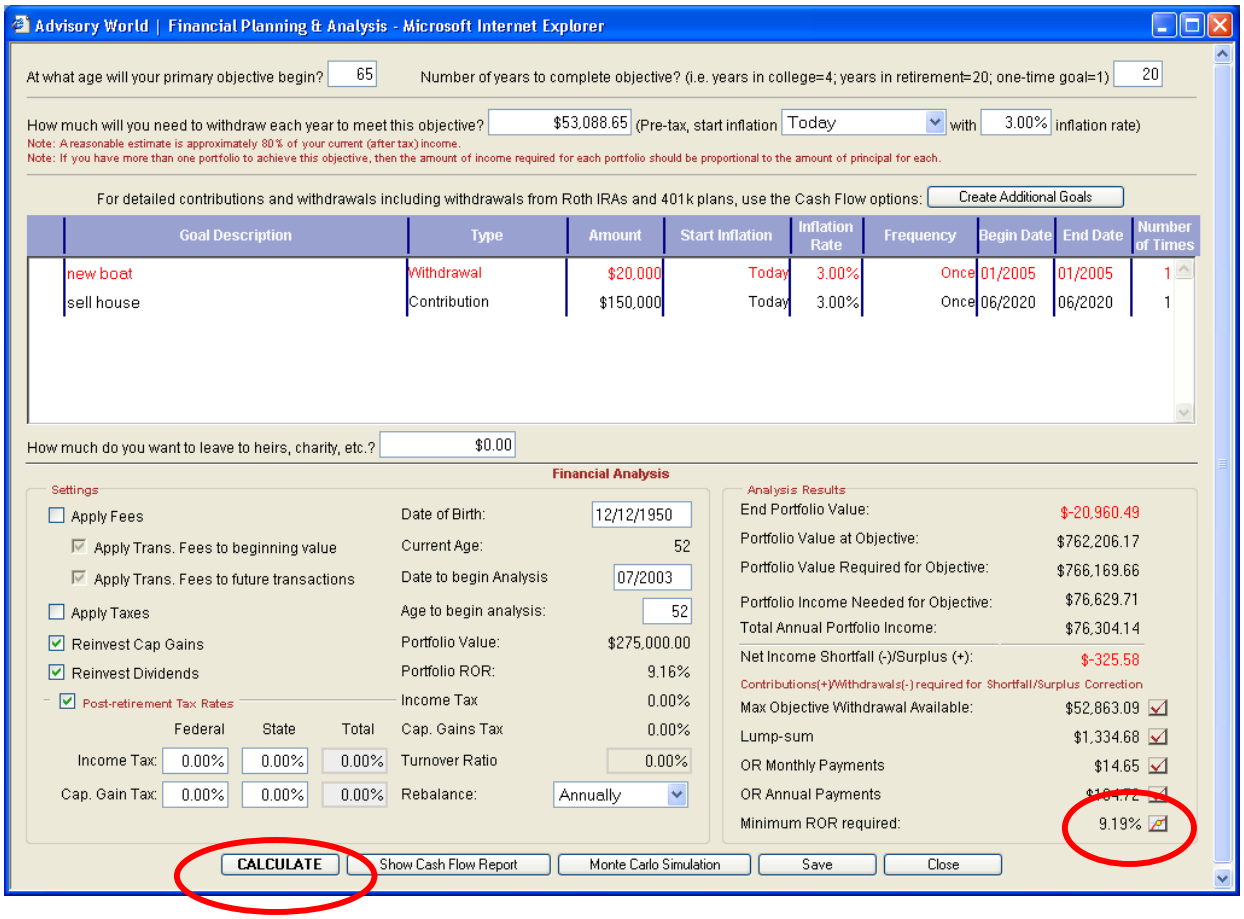
Saving Portfolios

After Entering the Dollar Values, Press Save . Next Click on the **Cash Flow & Plan Analysis** link.

Cash Flow & Financial Plan Analysis
Opens the dialog devoted to analyzing the client's financial plan. Input the main objective data (at the screen's top) and other financial goals (contributions to and withdrawals from the portfolio the client is planning to do). To add a financial goal, choose the "Create New Goal" button. You can change the values of financial goals directly in the table. Just click on a line and input boxes will appear where you can type in. To unselect a line, click anywhere on the screen outside the table. To delete a line, select it by clicking and press the "Del" button.

At the screen's bottom you see the analysis options and results. To update results, click on the "**CALCULATE**" button.
Clicking on the "**Show Cash Flow Report**" button displays the "**Cash Flow Report**" within the analyzed period.

The Financial Planning & Analysis screen is where you will enter your client's financial goals. The primary goal (in this case John's retirement) should be entered on the top of the screen. Notice how we have entered the number 25 for years to complete objective. Again in this case, the number 25 refers to the difference between John's Retirement age of 60 and the age of 85(simply a mortality assumption). Enter ancillary goals like John's monthly contribution (other examples may include College funding, major purchases or sales, social security etc.) by pressing the **Create New Goal** button. After all goals are entered press the **CALCULATE** button.


Advisory World | Financial Planning & Analysis - Microsoft Internet Explorer
At what age will your primary objective begin? 65
Number of years to complete objective? (i.e. years in college=4; years in retirement=20; one-time goal=1) 20
How much will you need to withdraw each year to meet this objective? $53,088.65 (Pre-tax, start inflation Today with 3.00% inflation rate)
Note: A reasonable estimate is approximately 80 % of your current (after tax) income.
Note: If you have more than one portfolio to achieve this objective, then the amount of income required for each portfolio should be proportional to the amount of principal for each.
For detailed contributions and withdrawals including withdrawals from Roth IRAs and 401k plans, use the Cash Flow options: Create Additional Goals
Goal Description | Type | Amount | Start Inflation | Inflation Rate | Frequency | Begin Date | End Date | Number of Times
new boat | Withdrawal | $20,000 | Today | 3.00% | Once | 01/2005 | 01/2005 | 1
sell house | Contribution | $150,000 | Today | 3.00% | Once | 06/2020 | 06/2020 | 1
How much do you want to leave to heirs, charity, etc.? $0.00
Financial Analysis
Settings
Apply Fees
Apply Trans. Fees to beginning value
Apply Trans. Fees to future transactions
Apply Taxes
Reinvest Cap Gains
Reinvest Dividends
Post-retirement Tax Rates
Federal State Total
Income Tax: 0.00% 0.00% 0.00%
Cap. Gain Tax: 0.00% 0.00% 0.00%
Date of Birth: 12/12/1950
Current Age: 52
Date to begin Analysis 07/2003
Age to begin analysis: 52
Portfolio Value: $275,000.00
Portfolio ROR: 9.16%
Income Tax 0.00%
Cap. Gains Tax 0.00%
Turnover Ratio 0.00%
Rebalance: Annually
Analysis Results
End Portfolio Value: $-20,960.49
Portfolio Value at Objective: $762,206.17
Portfolio Value Required for Objective: $766,169.66
Portfolio Income Needed for Objective: $76,629.71
Total Annual Portfolio Income: $76,304.14
Net Income Shortfall (-)/Surplus (+): $-325.58
Contributions(+)/Withdrawals(-) required for Shortfall/Surplus Correction
Max Objective Withdrawal Available: $52,863.09
Lump-sum $1,334.68
OR Monthly Payments $14.65
OR Annual Payments
Minimum ROR required: 9.19%
CALCULATE
Show Cash Flow Report
Monte Carlo Simulation
Save
Close

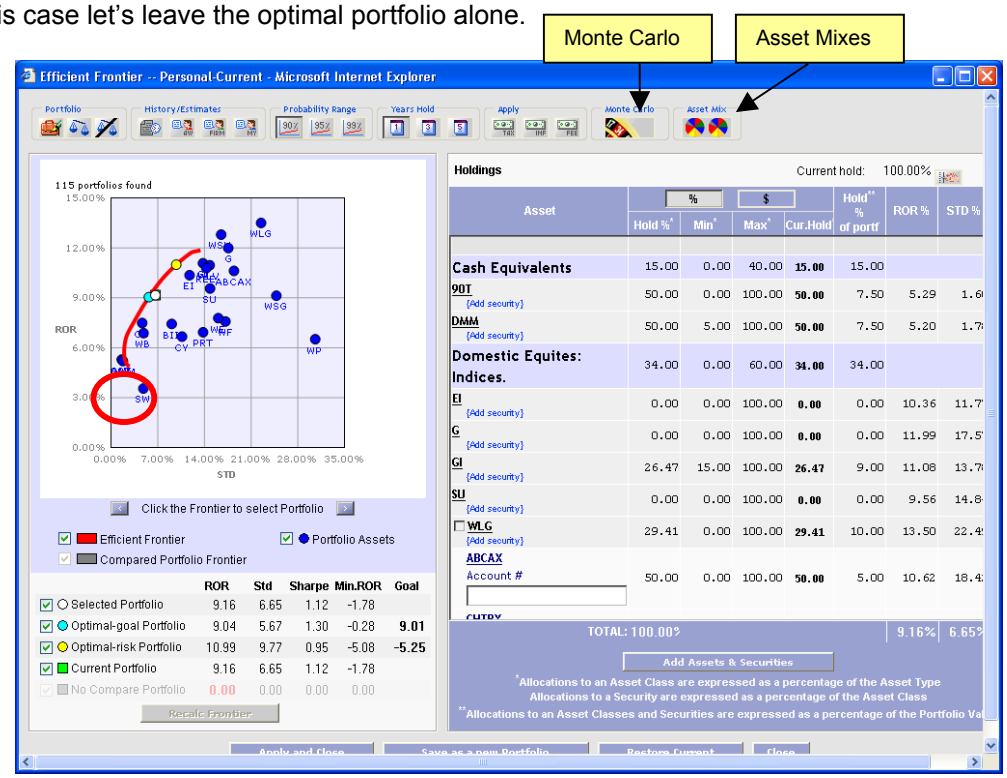
The resulting financial planning calculations can be seen in the Analysis Results section. The Max Objective Withdrawal Available based on the Future Value of this portfolio ROR of 9.16% in this case is $325.58, less than the $53,088 John requires. ICE offers recommendations (Lump-sum, Monthly or Annual Payments and Minimum ROR) to achieve the original goal. To apply any of these corrections click on the check mark next to them. In this case, let's click on the button to the right of the Minimum ROR required or 9.19%. This button will access the Efficient Frontier.

Optimizing Portfolios

The Efficient Frontier plots optimal portfolios and connects them with a red line. Each of the individual assets are plotted as blue dots and current portfolio is a green square. The Optimal-goal portfolio lies on the curve as a light blue dot and reflects the portfolio that will meet my clients minimum ROR requirement, in this case 9.99%. The yellow dot on the curve is a reflection of the Optimal-risk portfolio. This portfolio relates to the downside risk tolerance level that my client's Growth & Income profile allows for (-5.25).

Click on this yellow dot

The optimal asset mix can now be viewed in the table to the right of the curve. Several functions can be performed at this stage including constraining positions (see Setting Constraints below), editing estimates and introducing new assets. For this case let's leave the optimal portfolio alone.



The ICE application employs optimization to find two "optimal solutions". **Optimal Portfolio - Risk**, and **Optimal Portfolio – Goal**. For additional information on Optimization, click here.

Optimal Portfolio – Risk

When using the optimization function the application will first find the optimal portfolio that will achieve the highest possible rate of return without exceeding the Minimum ROR specified for the client. The Minimum ROR is set by the advisor by selecting an Investment Objective for the account (See Account Detail), by completing the 15 question Risk Profile Questionnaire, or by manually entering the Minimum ROR value. This value is the greatest amount of downside risk (real or nominal loss of principal) in any 12 month period that the client is willing to accept.

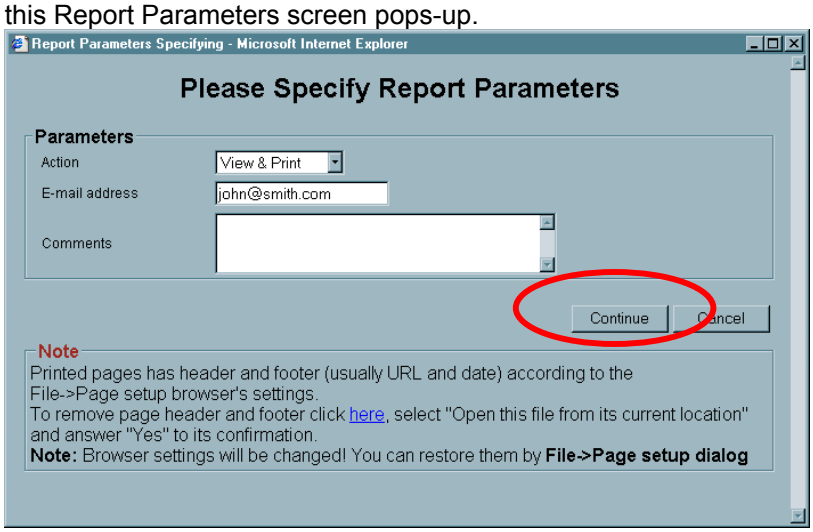
Optimal Portfolio - Goal

When using the optimization function the application will, in addition to finding the Optimal Portfolio-Risk, find the optimal portfolio that will achieve the client's financial goals. Using the Cash Flow & Financial Plan Analysis tools the advisor can set all of the client's financial goals such as college education, major purchases, retirement, leaving money to heirs and any other cash flow contributions and/or withdrawals for any time period. The Optimal Portfolio – Goal is the best portfolio alternative for achieving the client's financial goals with the least amount of risk (volatility).

The advisor and client can now review all possible optimal portfolios to determine which investment strategy is best suited to the client's financial needs and risk tolerance.

Next click the Monte Carlo Icon

Choose continue when this Report Parameters screen pops-up.


Report Parameters Specifying - Microsoft Internet Explorer
Please Specify Report Parameters
Parameters
Action
View & Print
E-mail address
john@smith.com
Comments
Continue
Cancel
Note
Printed pages has header and footer (usually URL and date) according to the File->Page setup browser's settings.
To remove page header and footer click here, select "Open this file from its current location" and answer "Yes" to its confirmation.
Note: Browser settings will be changed! You can restore them by File->Page setup dialog

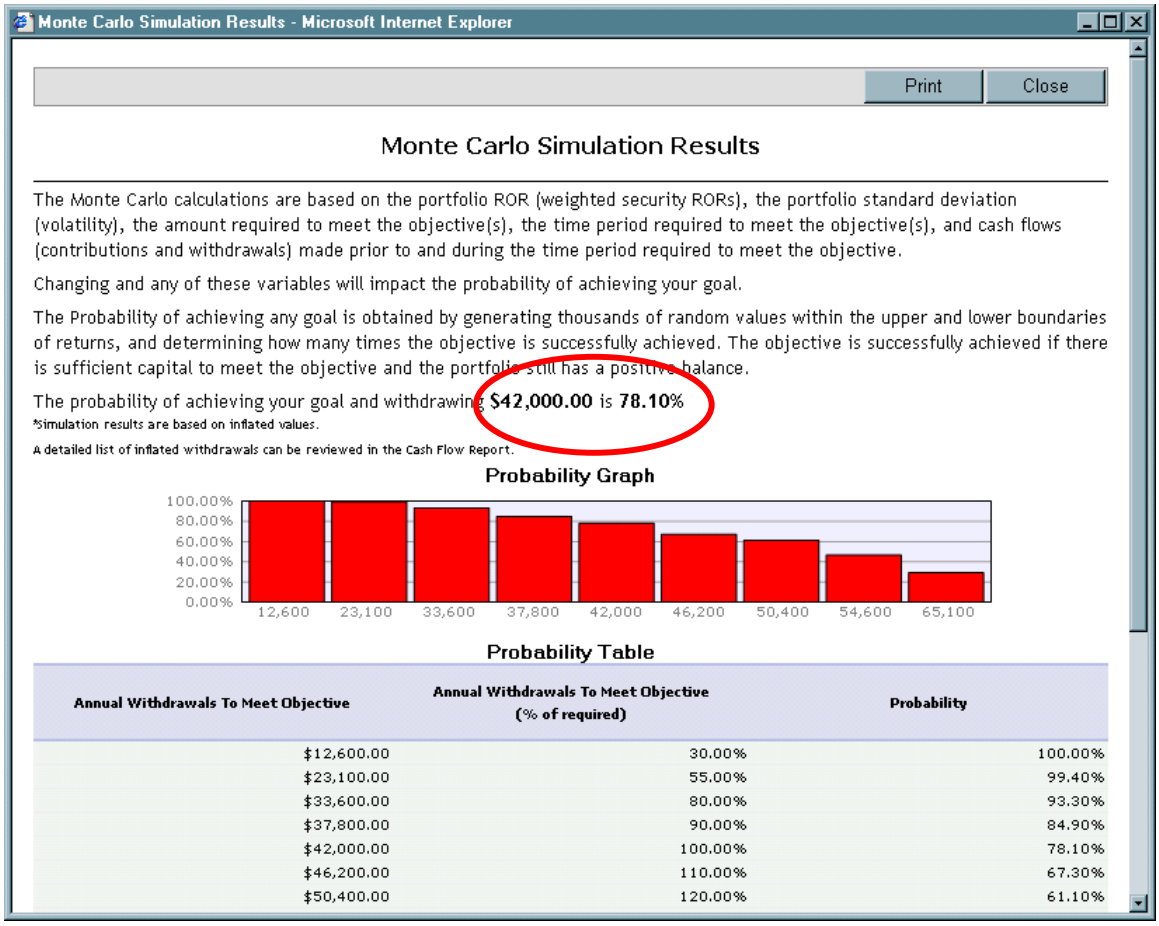
MONTE CARLO SIMULATION

Our unique Monte Carlo simulator is a very advanced mathematical model developed by Professor Giray Okten at the Dept of Mathematical Sciences of Ball State University.

- The simulation eliminates the problem of over concentration of probability runs by spreading iterations throughout the entire grid of normal distribution.
- The Monte Carlo calculations are based on the portfolio ROR (weighted security RORs), the portfolio standard deviation (volatility), cash flows (contributions and withdrawals) made prior to and during the time period required to meet the objective, the amount required to meet the objective(s), and the time period required to meet the objective(s).
- Determine the probability of growing a portfolio to a specified value by a pre-determined date or age.
- Determine the probability of achieving a goal(s) such as having sufficient capital after retirement to meet the investor's income requirements through mortality, or sending children through college.
- Review alternative strategies by quickly and easily modifying elements such as portfolio return, the age at which the objective will be met, the amount of income required, the length of time to complete the objective and many other variables.
- Review the actual time-weighted cash flows leading to completion of the investor's objective(s).
- The Monte Carlo Report is graphic and easy to understand and is a great marketing tool.

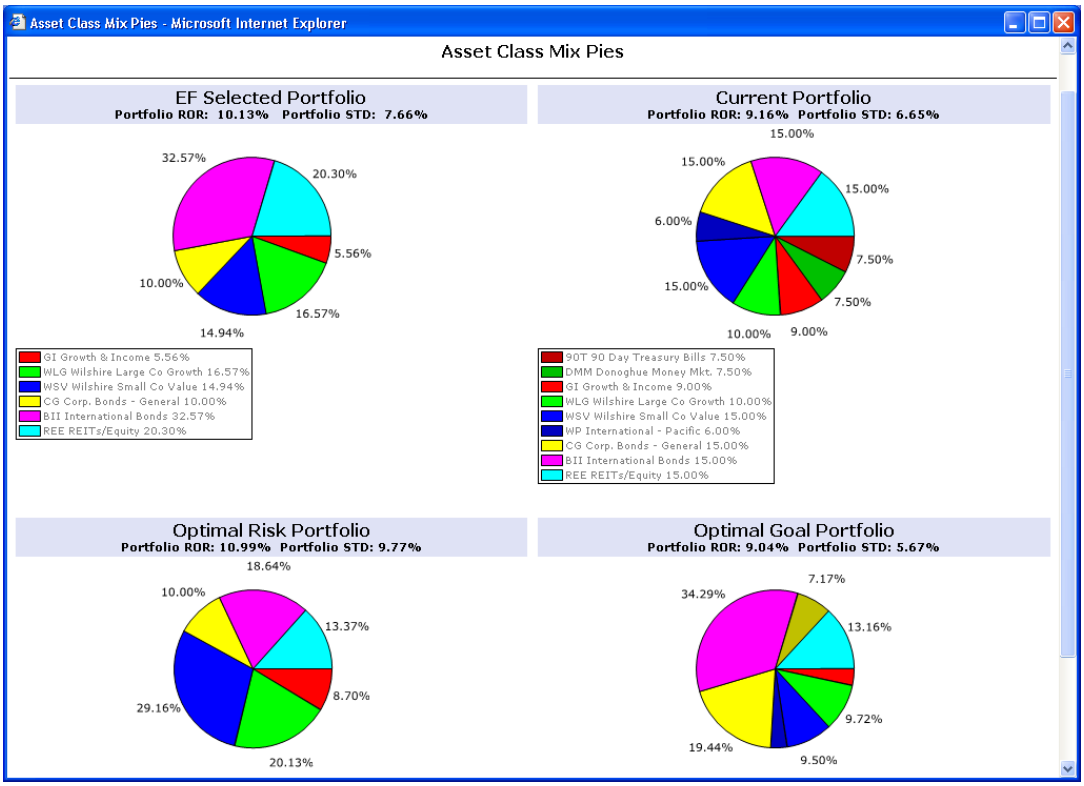
The Monte Carlo Simulation results are strictly goal based. The graphic and table tell us that the probability of achieving our client's goal and withdrawing $42,000 is 78.10% based on this optimal portfolio. What does this mean? Even though a straight financial calculation may result in a portfolio meeting or even exceeding a client's goals, when variance is introduced (via Monte Carlo Simulation), the probability of actually reaching these goals may not be very high at all. In this scenario the 78.10% probability is relatively high. Different probability levels and their associated Annual Withdrawals are displayed in the graphic and table.

*Note: Your probability of goal achievement may slightly vary from these results. This is due to the several thousand iterations being run.


Monte Carlo Simulation Results - Microsoft Internet Explorer
Print
Close
Monte Carlo Simulation Results
The Monte Carlo calculations are based on the portfolio ROR (weighted security RORs), the portfolio standard deviation (volatility), the amount required to meet the objective(s), the time period required to meet the objective(s), and cash flows (contributions and withdrawals) made prior to and during the time period required to meet the objective.
Changing and any of these variables will impact the probability of achieving your goal.
The Probability of achieving any goal is obtained by generating thousands of random values within the upper and lower boundaries of returns, and determining how many times the objective is successfully achieved. The objective is successfully achieved if there is sufficient capital to meet the objective and the portfolio still has a positive balance.
The probability of achieving your goal and withdrawing $42,000.00 is 78.10%
*Simulation results are based on inflated values.
A detailed list of inflated withdrawals can be reviewed in the Cash Flow Report.
Probability Graph
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
12,600
23,100
33,600
37,800
42,000
46,200
50,400
54,600
65,100
Probability Table
Annual Withdrawals To Meet Objective
Annual Withdrawals To Meet Objective (% of required)
Probability
$12,600.00 30.00% 100.00%
$23,100.00 55.00% 99.40%
$33,600.00 80.00% 93.30%
$37,800.00 90.00% 84.90%
$42,000.00 100.00% 78.10%
$46,200.00 110.00% 67.30%
$50,400.00 120.00% 61.10%

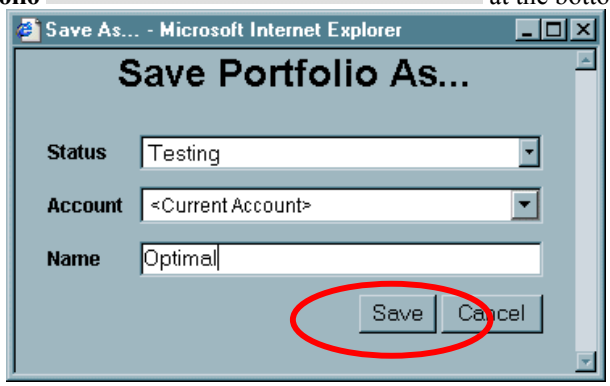
After analyzing the Monte Carlo Results, close the window.

To review asset mixes for the current portfolio, the selected portfolio, the optimal-risk and optimal-goal portfolios, click on the Asset Mix button.



Next click on **Save as a new Portfolio**

at the bottom of the Efficient Frontier page.



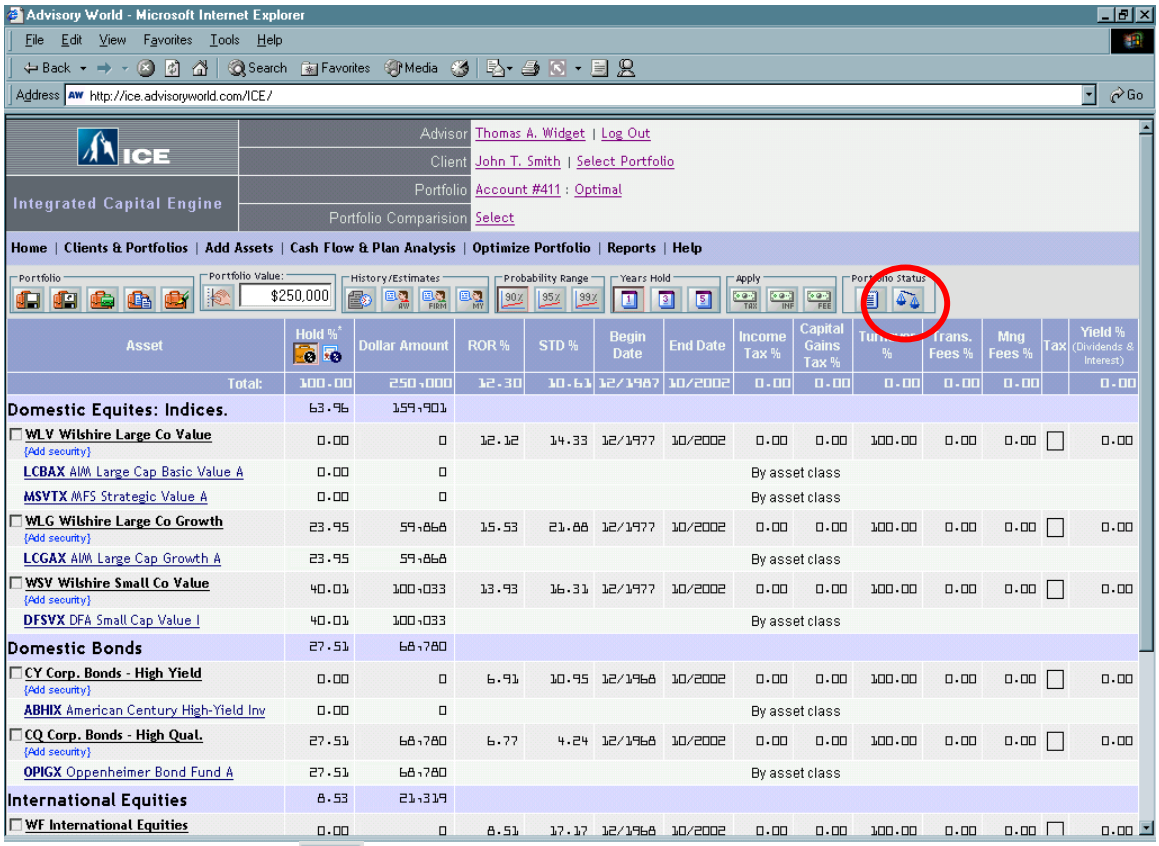
Name the portfolio Optimal (or Recommended, Proposed or Other).
Press **Save**.

Choose **Close**

at the bottom of the Portfolio Optimization Page to return to the Financial Planning Screen.

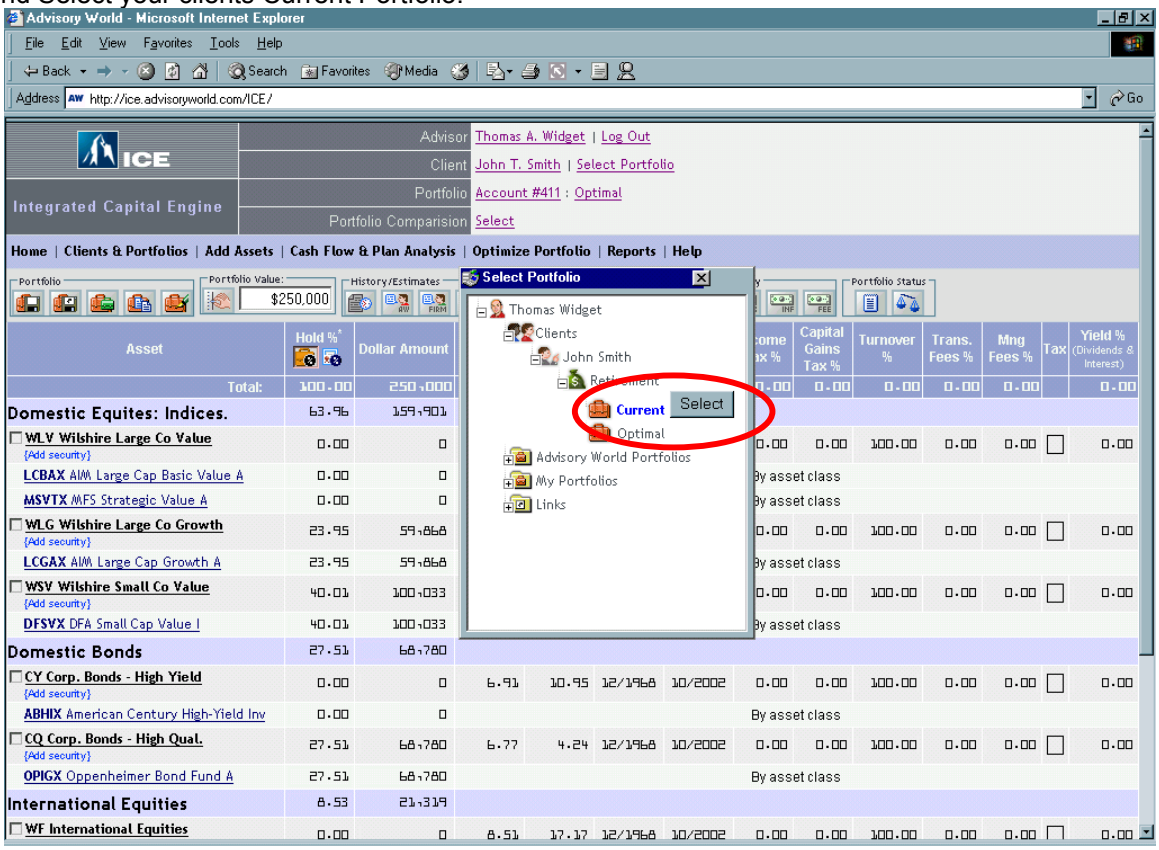
Choose **Close** on the Financial Planning Screen to return to the Portfolio Builder.

The Portfolio Builder Screen will be active and now displays the new Optimal portfolio.


Advisory World - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://ice.advisoryworld.com/ICE/
ICE
Integrated Capital Engine
Advisor Thomas A. Widget | Log Out
Client John T. Smith | Select Portfolio
Portfolio Account #411 : Optimal
Portfolio Comparision Select
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help
Portfolio Value: $250,000
Asset
Hold %
Dollar Amount
ROR %
STD %
Begin Date
End Date
Income Tax %
Capital Gains Tax %
Trans. Fees %
Mng Fees %
Tax
Yield %
Total: 100.00 250,000 12.30 10.61 12/1987 10/2002 0.00 0.00 0.00 0.00 0.00 0.00
Domestic Equites: Indices. 63.96 159,901
WLV Wilshire Large Co Value 0.00 0 12.12 14.33 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
LCBAX AIM Large Cap Basic Value A 0.00 0 By asset class
MSVTX MFS Strategic Value A 0.00 0 By asset class
WLG Wilshire Large Co Growth 23.95 59,868 15.53 21.88 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
LCGAX AIM Large Cap Growth A 23.95 59,868 By asset class
WSV Wilshire Small Co Value 40.01 100,033 13.93 16.31 12/1977 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
DFSVX DFA Small Cap Value I 40.01 100,033 By asset class
Domestic Bonds 27.51 68,780
CY Corp. Bonds - High Yield 0.00 0 6.91 10.95 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
ABHIX American Century High-Yield Inv 0.00 0 By asset class
CQ Corp. Bonds - High Qual. 27.51 68,780 6.77 4.24 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00
OPIGX Oppenheimer Bond Fund A 27.51 68,780 By asset class
International Equities 8.53 21,319
WF International Equities 0.00 0 8.51 17.17 12/1968 10/2002 0.00 0.00 100.00 0.00 0.00 0.00

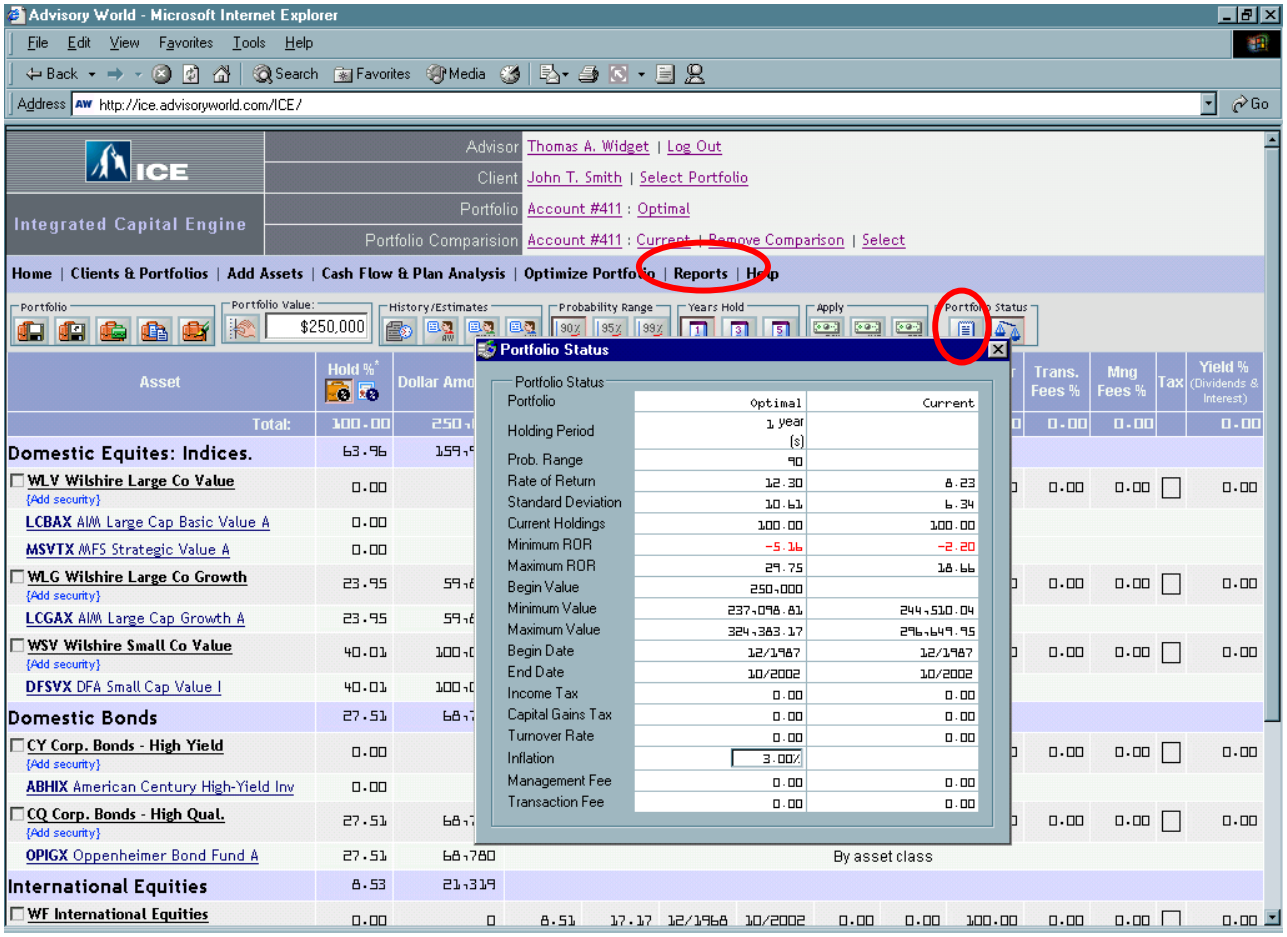
Click on **Compare Portfolio** Icon

Locate and Select your clients Current Portfolio.



After Calculating you can click on the **Portfolio Status Button**

The Status of each portfolio is displayed side-by-side.

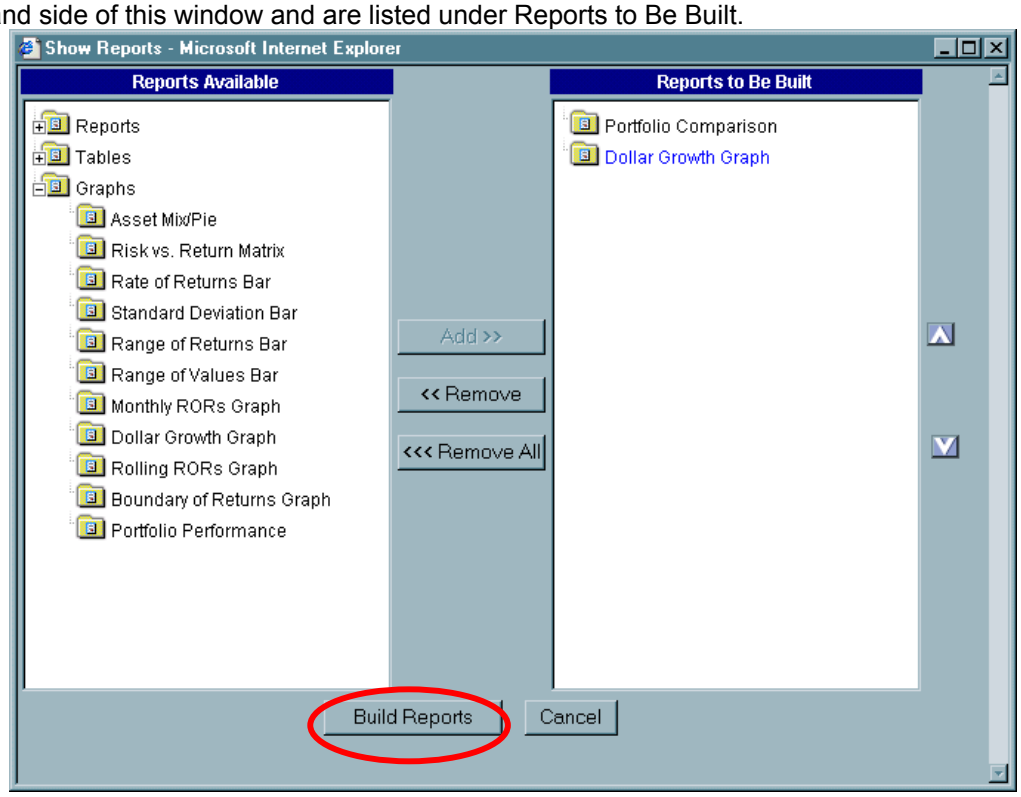


After reviewing, close the window. Next click on **Reports**.

REPORTS

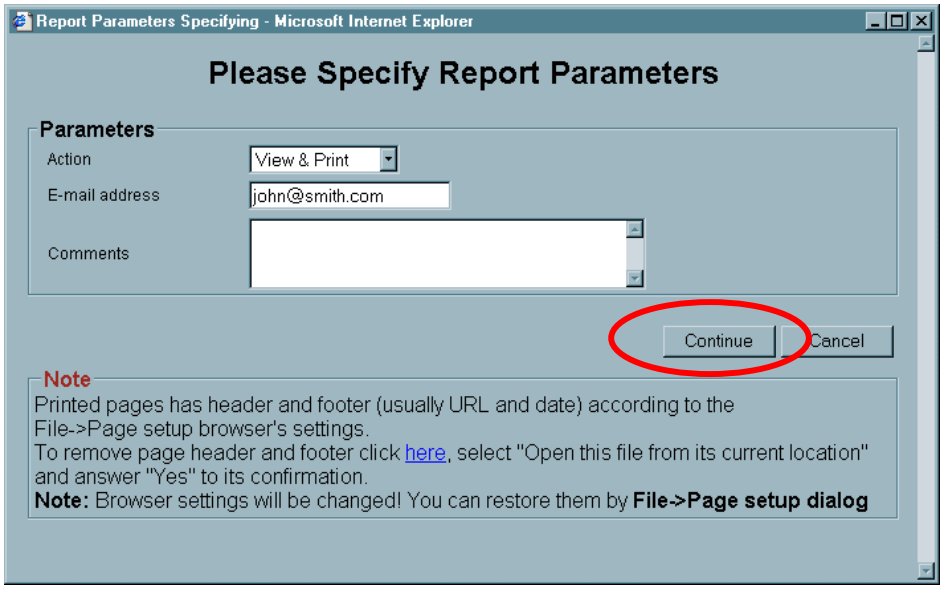
The pull-down list allows selecting any or all reports, graphs and tables. Within the report window, you can use the following buttons: "Print" - to print a report. "Send" - to send a report to the client (receiver must use MS Outlook and have MS Internet Explorer v.5 or later installed on his PC). "Close" - to close the report window.
Besides, the "Cash Flow Report" window allows you to set the analysis period. Just input corresponding dates and choose "Recalc". You can also get a monthly or annual report by selecting appropriate radial button.

Select the reports that you would like to show to your client and press Add>> The selected reports can be viewed on the right hand side of this window and are listed under Reports to Be Built.



Press **Build Reports**.

Choose **Continue** when this Report Parameters screen pops-up.


Report Parameters Specifying - Microsoft Internet Explorer
Please Specify Report Parameters
Parameters
Action
View & Print
E-mail address
john@smith.com
Comments
Continue
Cancel
Note
Printed pages has header and footer (usually URL and date) according to the File->Page setup browser's settings.
To remove page header and footer click here, select "Open this file from its current location" and answer "Yes" to its confirmation.
Note: Browser settings will be changed! You can restore them by File->Page setup dialog

You should see the same reports as seen here: http://www.advisoryworld.com/ice/casestudyreports.html

CASE SOLUTION

John's current portfolio performance was clearly insufficient in terms of his goals, even on a straight financial plan projection. Using our optimal portfolio, John will achieve his financial goals using a straight financial calculation and do so with close to 80% probability.

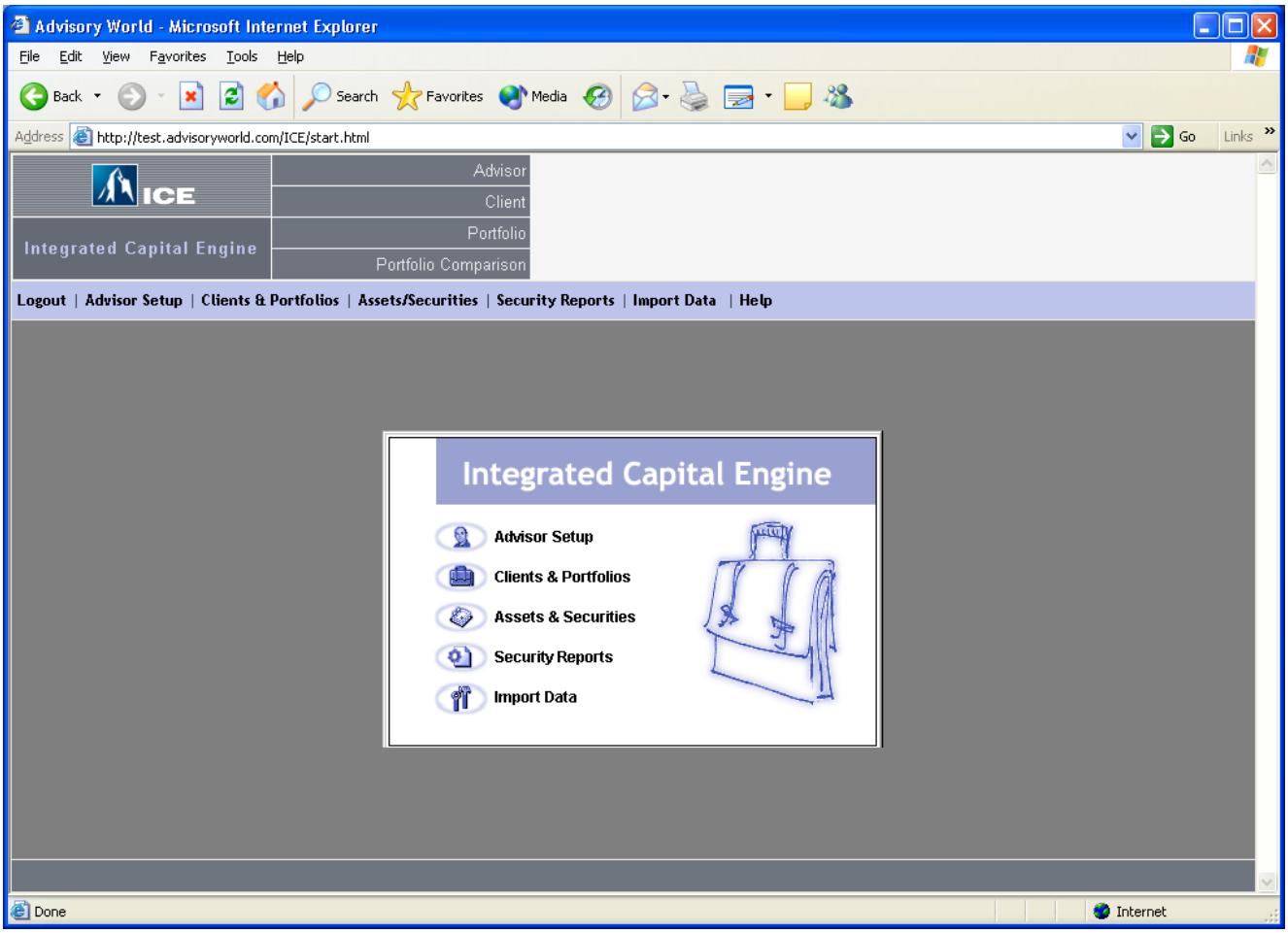
ADVISORS AND THE ICE APPLICATION

The ICE programs are intended to be used as an asset allocation tool. It is not intended to provide "absolute" solutions to portfolio decisions or investment advice. There are no "magical" answers to investment decisions. While these programs are extremely sophisticated, they cannot replace your own experience, knowledge and expertise, nor can they eliminate the fiduciary responsibility of the advisor to provide management services. The ICE programs are designed to provide a means of analyzing historical information and to provide advisors with the ability to build theoretically optimal portfolios based on historical and/or forecasted rates of return, standard deviations, correlations and covariances for the selected investments.

Portfolio and asset performance produced by the programs cannot guarantee a future rate of return. These illustrations only suggest the possibility of what may occur in the future based on historical performance and/or the advisors forecasted return and volatility assumptions.

A GENERAL OVERVIEW OF ICE FUNCTIONS

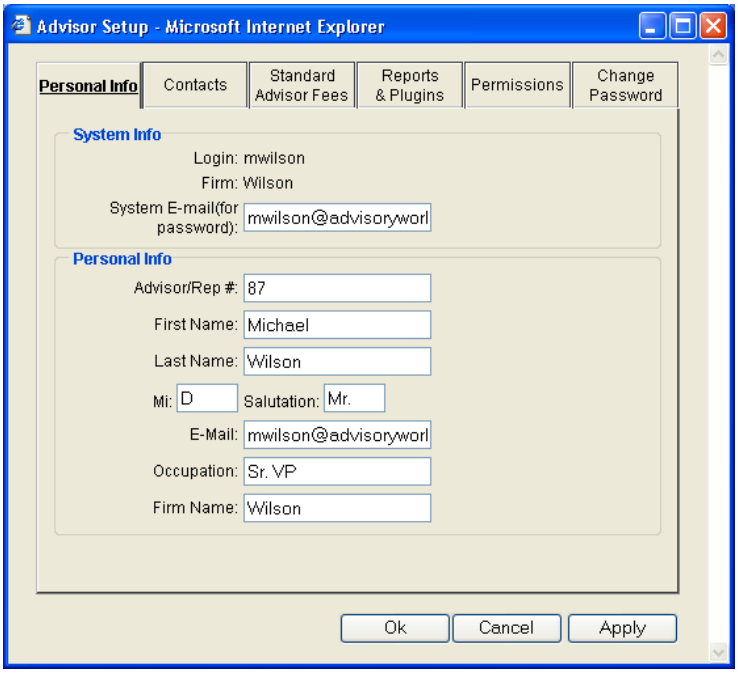
ADVISOR SETUP, CLIENTS & PORTFOLIOS, ASSETS & SECURITIES, IMPORT DATA



Advisor Setup - set up information about the advisor
Clients & Portfolios - select or add new clients, accounts and portfolios
Asset & Securities - review information about assets/securities; estimate RORs/STDs, add asset/security history
Security Reports - hypothetical performance and overviews for mutual funds, stocks and variable annuities; Factor Analysis and the Security Screener
Import Data - Import data from Ramcap & Power Optimizer, Statement One, Advisor's Assistant, AdvisorMart (Advent), dbCams; synchronize ICE and ICE PC applications

ADVISOR SETUP

Enter information about yourself and your company as well as any management fees you expect to charge.



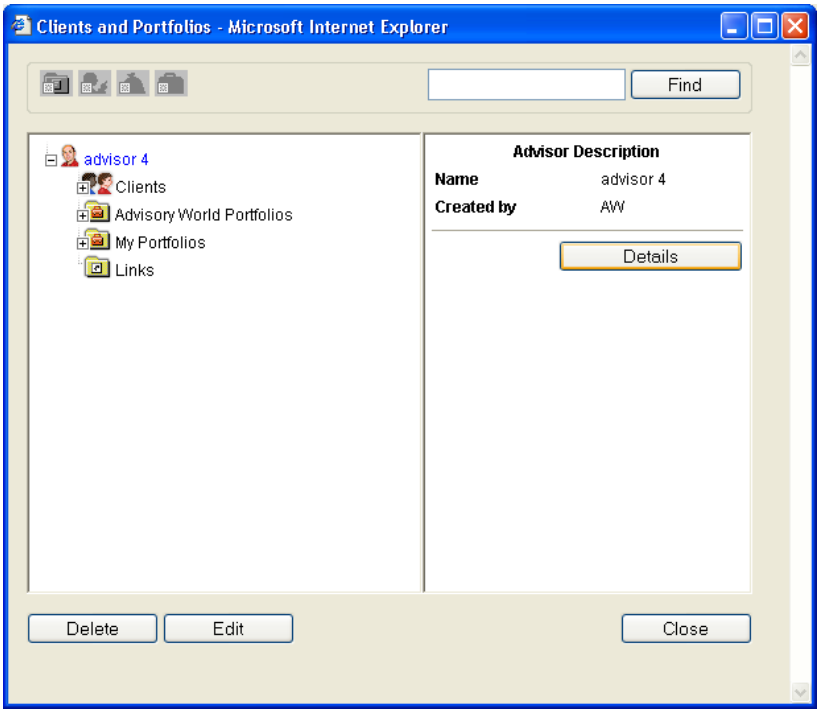
REPORTS & PERMISSIONS

The Reports and Permissions tabs will tell you what reports and system functions are permitted. To add plug-in modules or databases, contact us at sales @advisoryworld.com or call us at (800) 480-3888.

CHANGING PASSWORD

By selecting the Change Password tab you may change the Password used for accessing the ICE applications.

CLIENTS & PORTFOLIOS



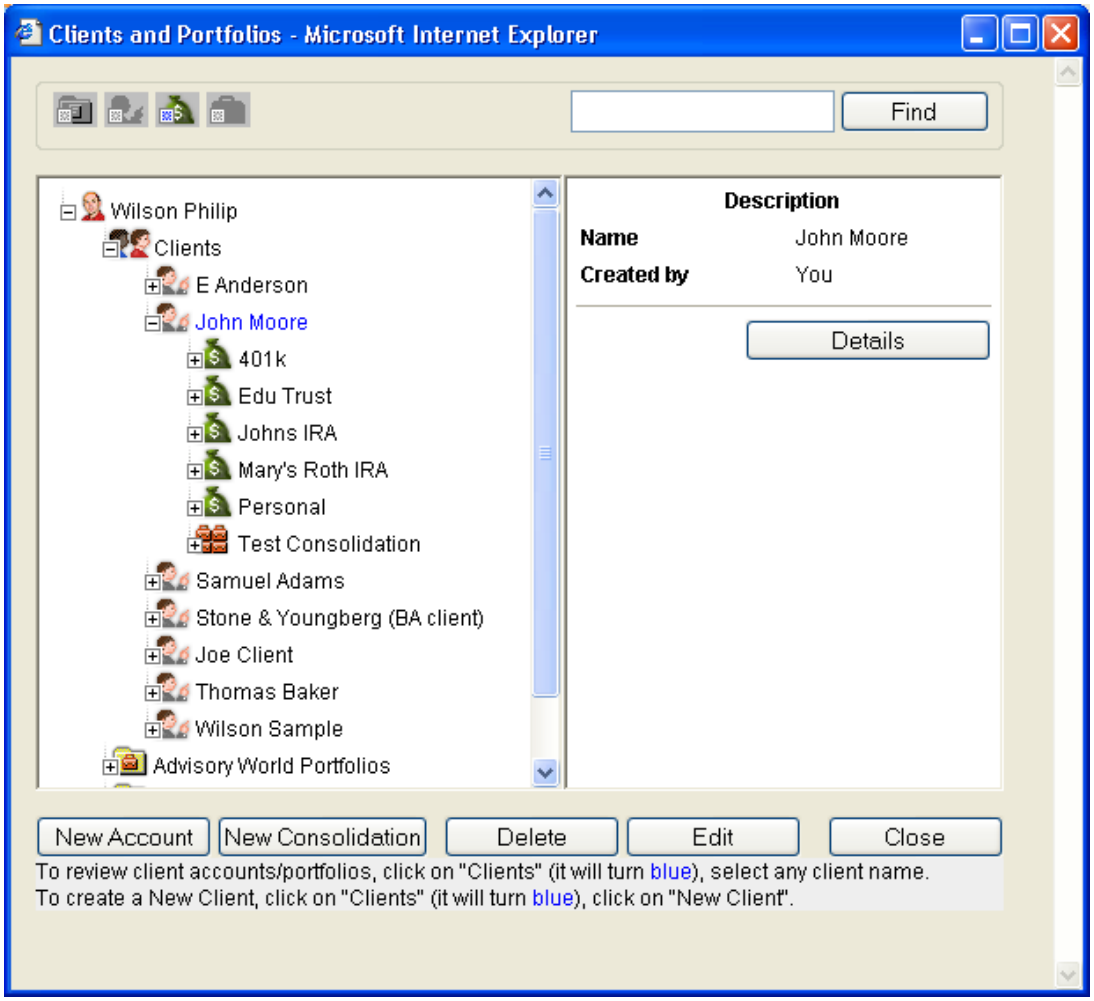
From the Main menu, choose Clients & Portfolios The 'Clients & Portfolios' window appears on top. In the left part of this window, you see the tree, which contains the following folders:

1. **"Clients"** - contains your list of clients.

2. **"Advisory World portfolios"**, **"Firm portfolios"**, **"My portfolios"** - contain the predefined portfolios provided by Advisory World, your Firm and your ("My") user-defined portfolios respectively. Within these folders, are the subfolders named according to a portfolio objective: "Aggressive", "Growth", "Income", etc. Moving a predefined portfolio into corresponding folder (by drag-n-drop) means that this portfolio will be recommended to be used by the clients with given objective.
3. **"Links"** is the folder where you can group portfolios, accounts and clients by creating folders and moving (by drag-n-drop) objects to them.

Each client folder is organized as follows:

1. The first level contains accounts each corresponding to the client's brokerage account.
2. The second level: each account may contain various portfolios. The portfolio marked as 'current' (highlighted in bold) corresponds to the current portfolio at given brokerage account. Besides, within an account's folder, you can create one 'proposed' portfolio (in italics) and several 'testing' portfolios. In other words, each client possesses brokerage accounts, to which portfolios themselves are added. Within this list, you can create, edit and delete your clients, their accounts and attached portfolios as well as your pre-defined portfolios.



Creating a new client

To create a new client.

1. Select the 'Clients' folder (selected folder is highlighted in blue).
2. Click on the 'New Client' button (lower left part of screen).
3. The 'Client Setup' window appears on top.
4. Fill in the fields concerning this client.

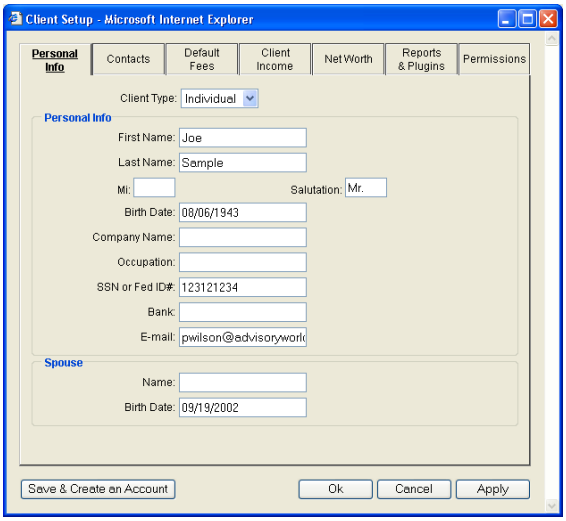
Giving Clients Access to Reports

Advisors can give clients access to selected reports using the Reports &n Plugins tab. If you do not have permission to allow clients access to reports, contact AdvisoryWorld about licensing this permission.

To setup the permission for clients to access permitted reports:

1. click on the 'Permissions' tab
2. check the login box
3. assign a Username and Password to the client (this will give the client read-only access to view reports)

After you have finished editing, choose OK to close the window and append your new client to the list. If you choose 'Apply', the client will be created and the 'Clients & Portfolios' window will remain staying on top. Choosing 'Cancel' will close the window and nothing will be added to the list. Choosing 'Save & Create an Account' will save the client, close the window, create a new account and start the "Account Setup" dialog.



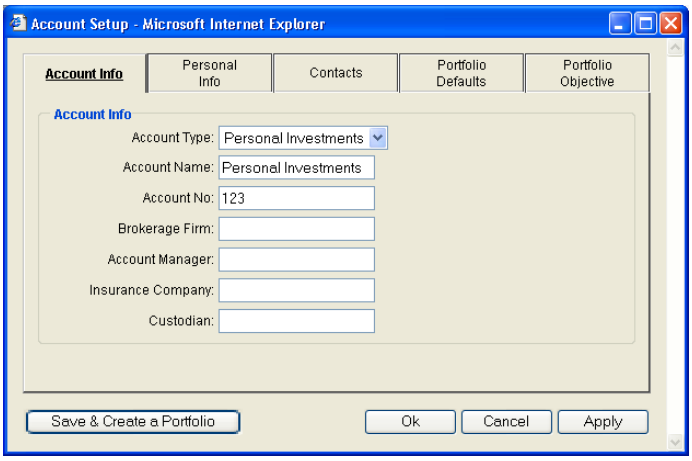
Editing/Reviewing a client's information

Editing a client is performed similarly:

1. Select required client by clicking (selected item is highlighted in blue).
2. Choose the 'Edit' or ‘Detail’ button.

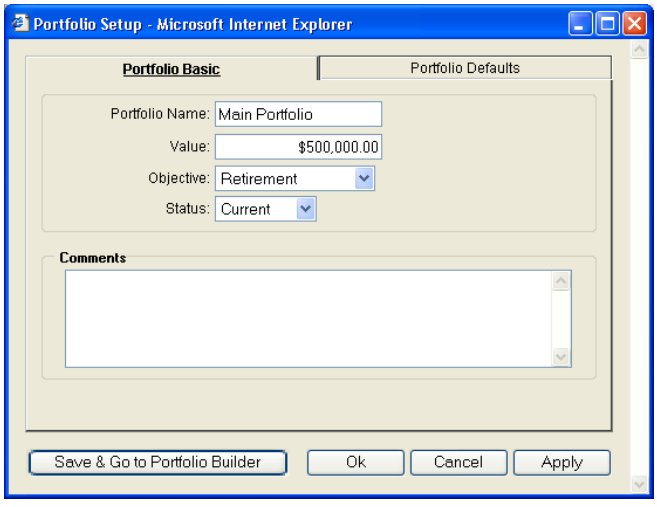
CREATING AN ACCOUNT

1. Select the client you wish to attach a new account to (selected client is highlighted in blue).
2. Choose the 'New Account' button.
   The 'Account Setup' window appears on top.
3. Fill in the fields concerning this client's account.
4. If you are not sure of a Portfolio Objective (dialog's rightmost tab) for the account, then click the 'Run Questionnaire' button and follow the instructions.
5. After you have finished editing, choose OK to close the window and append the new account to the designated client. If you choose 'Apply', the account will be created and the 'Accounts Setup' window will remain staying on top. Choosing 'Cancel' will close the window and nothing will be added to the list. Choosing 'Save & Create a Portfolio' will save the account, close the window, create new portfolio and start the "Portfolio Setup" dialog.



CREATING A PORTFOLIO

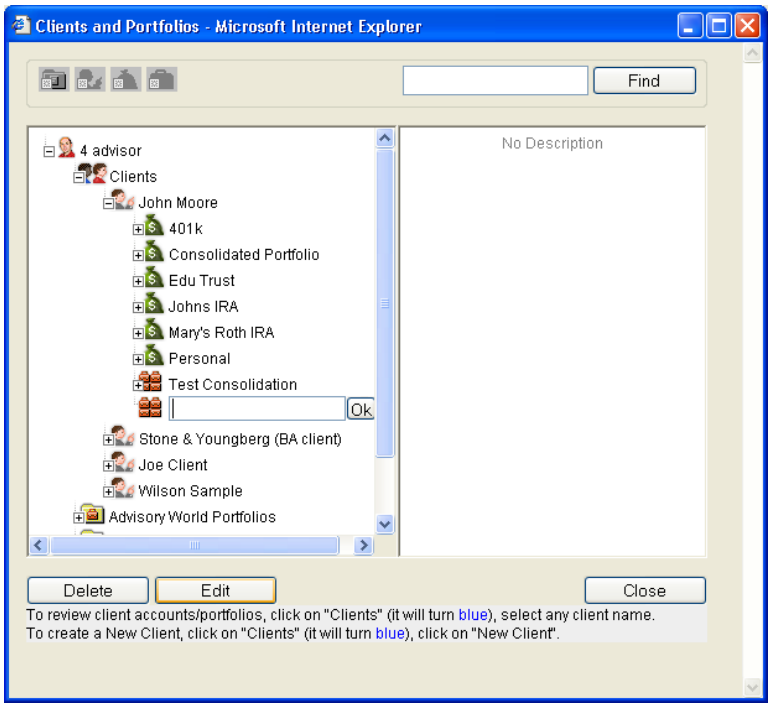
1. Select the account you wish to attach a new portfolio to (selected account is highlighted in blue).
2. Choose the 'New Portfolio' button. New portfolio for this client/account will be created.
3. The 'Portfolio Setup' window appears on top.
4. Fill in the fields concerning this new portfolio.
5. After you have finished editing, choose OK to close the window and append the new portfolio to the designated account. If you choose 'Apply', the portfolio will be created and the 'Portfolio Setup' window will remain staying on top. Choosing 'Cancel' will close the window and nothing will be added to the list. Besides, you can immediately "Save & Go to Portfolio Builder" to fill the portfolio with assets & securities and analyze its performance. Just choose this button.



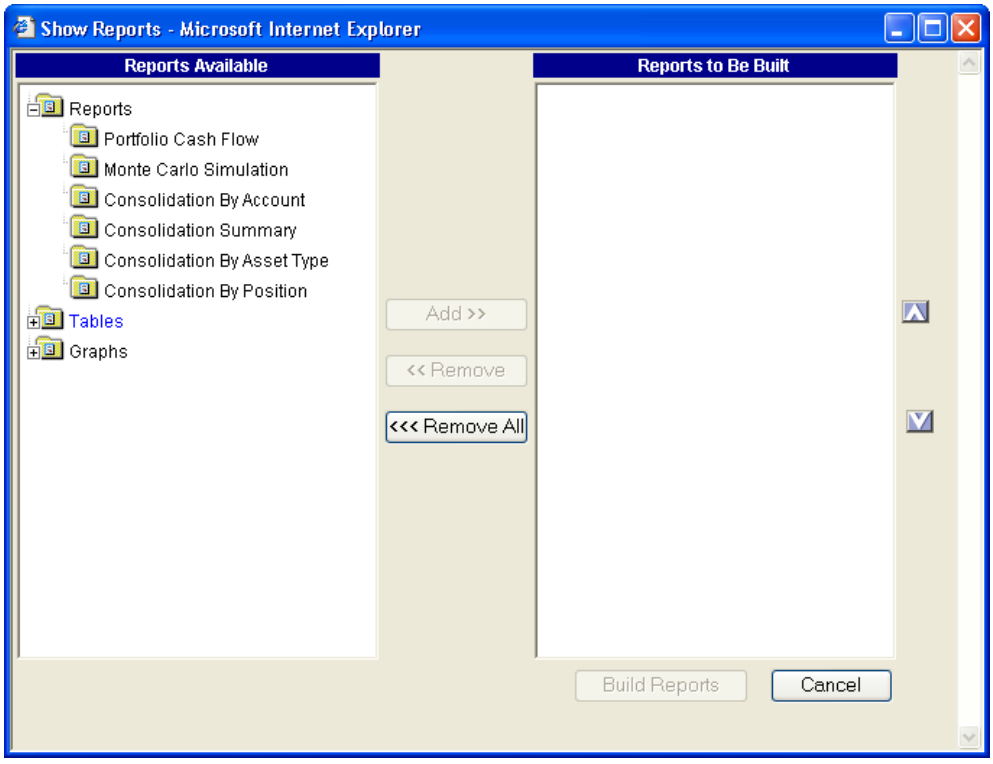
CONSOLIDATING PORTFOLIOS

The ICE application allows users to create consolidated portfolios by linking as many portfolios as desired into one overall portfolio. These consolidated portfolios can include taxable and non-taxable portfolios.

1. Select the client you want to use for consolidating portfolios.
2. Name the new Consolidated Portfolio

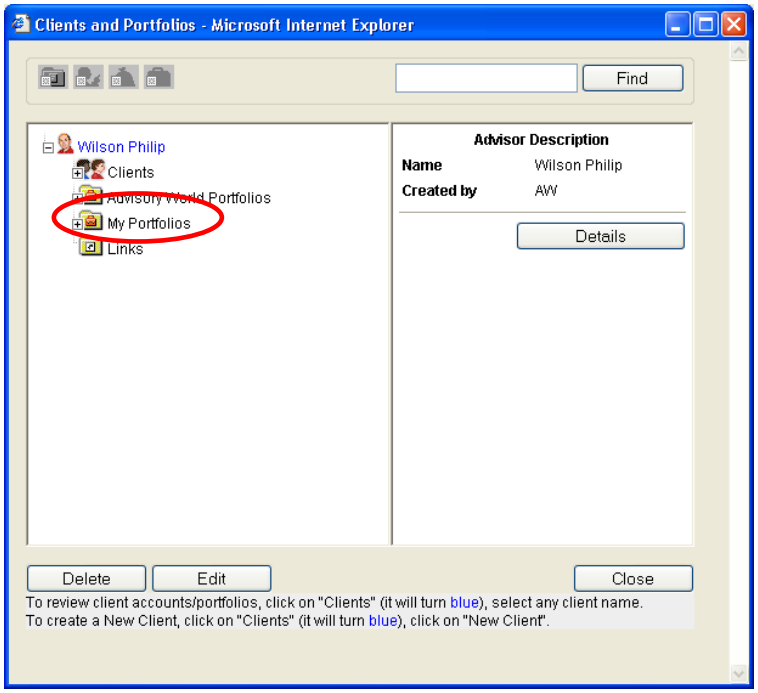


3. Drag and drop all of the portfolios you want into the new Consolidated Portfolio. Any changes made to these portfolios will automatically update the same portfolio included in the consolidated portfolio.
4. To review the portfolio click on Reports and select the reports, tables or graphics you want.



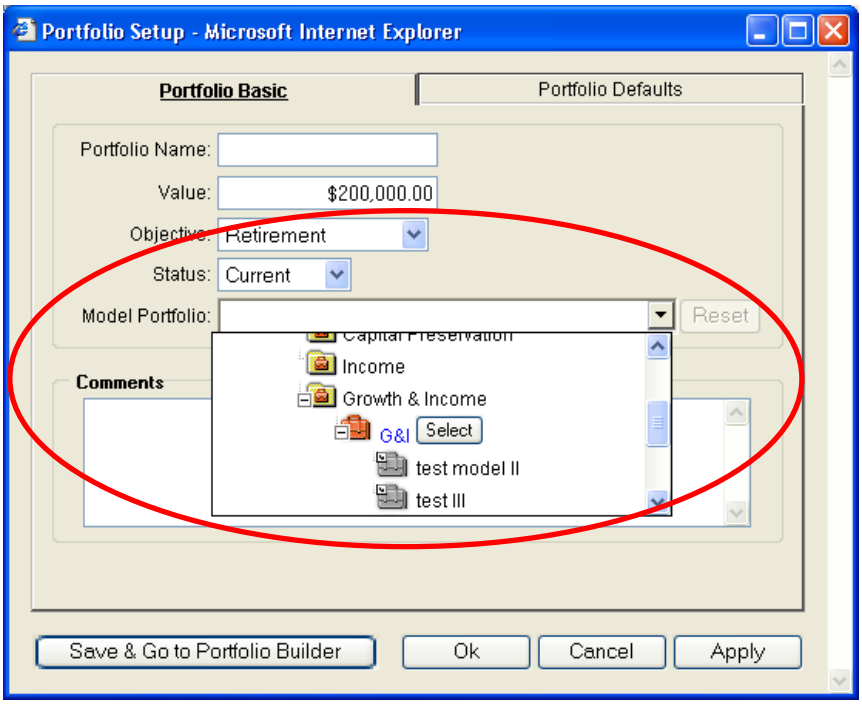
CREATING MODEL PORTFOLIOS

Create model portfolios by selecting “My Portfolios” and then creating a new portfolio. These portfolios can then be quickly and easily copied or linked to new client portfolios.

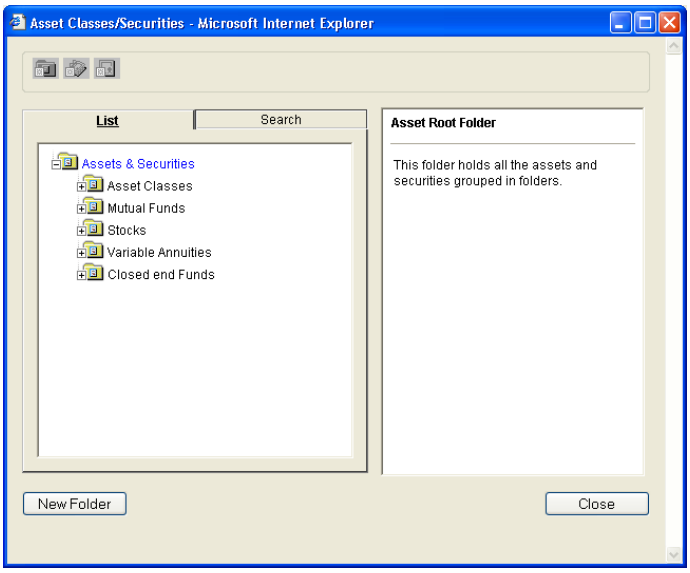


MODEL PORTFOLIO LINKS

Users can link client portfolios to "model" portfolios such as AW's or My Portfolios. It automatically starts the client out with a model portfolio and allocates capital proportionately. **If the model is changed, all linked client portfolios are changed as well, and the advisor is notified of the change.**



ASSETS/SECURITIES



From the Main menu, choose Assets/Securities The 'Asset Classes/ Securities' window appears on top. The two tabs are provided in the left part of this window: List and Search

When the List tab is chosen, you see assets and securities represented as a tree, where you expand/collapse its branches by clicking on the plus/minus marks.

Asset Classes are grouped in Asset Types. Securities are grouped in folders.

Within this list, you can create, edit, delete and move (by drag-n-drop) user-defined asset types, asset classes, securities and folders.

CREATING YOUR OWN ASSET CLASS

To create your own asset class.

1. Expand appropriate asset type i.e. where you want to assign your new asset class.
2. Click on the **'New Asset Class'** button.
3. The **'Asset/Security**' window appears on top.
4. Fill in the fields concerning your asset class.
5. Under the **History** tab, specify the time horizon and input historical values for each year.
6. After you have finished editing, choose OK to close the window and append your new asset class to the designated asset type. If you choose 'Apply', the asset class will be created and the 'Asset/Security' window will remain staying on top. Choosing 'Cancel' will close the window and nothing will be added to the list.

Editing an asset class (asset type, security)

Editing an asset class (asset type, security) is performed similarly:

1. Select required item by clicking (selected item is highlighted in blue).
2. Choose the 'Edit' button.

   Note that you may fully edit only those items (asset types, asset classes and securities, folders) that you have created. Within other objects (those provided by Advisory World of your Firm), you may only type in 'User Performance Estimates' and User Classification (assigned Asset Class) for securities.

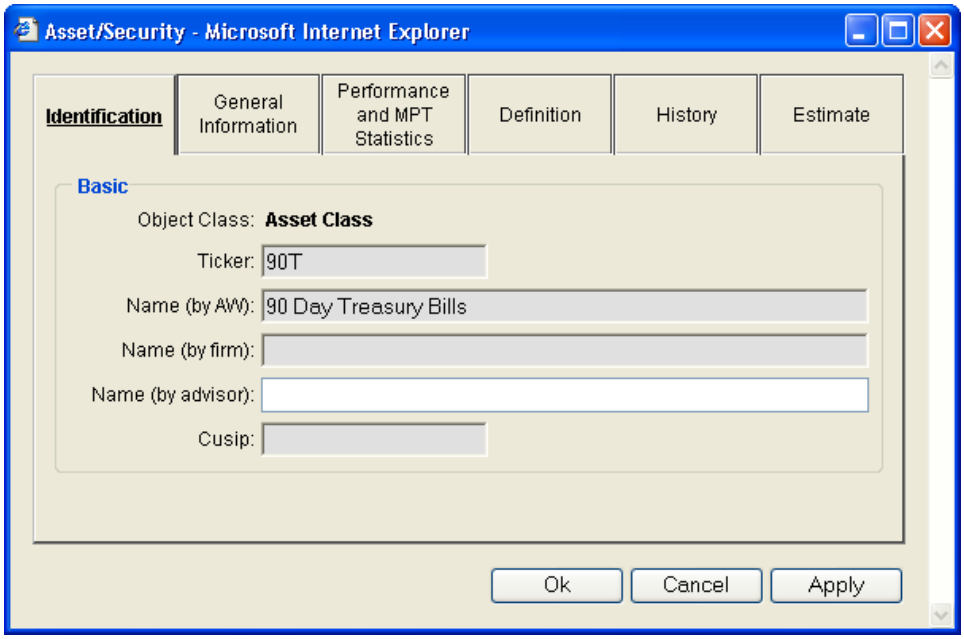
Deleting an asset class (asset type, security)

1. Select required item by clicking (selected item is highlighted in blue).
2. Choose the 'Delete' button.

Note: you may delete only the created by you items (asset types, asset classes, securities and folders).

Changing the name of an asset/security

The name of any asset or security can be changed in the Assets/Securities section from the Main Menu. Click on Assets/Securities, select the asset/security to be changed, click on Details and enter the new name.



Advisors can change the name of an asset/security in a portfolio simply by clicking on the asset/security in the Portfolio Builder screen and changing the name. To review the Details, click on the ticker symbol.

Classifying asset classes

As you already know, each asset class belongs to a certain asset type. Changing the classification of an asset class is easy: just drag-and-drop it to another asset type. Point to the asset class which classification you wish to change, hold the left mouse button and move it to the new asset type. When you reach the desired asset type (the cursor is a down arrow), release the mouse button. The 'Classified by' field in the 'Description' pane indicates who (AW, your firm or you personally) created and classified the asset class. You can nullify the results of your classification by choosing the 'Default classification' button.

Classifying securities

Securities are grouped into folders by fund family or fund group. You can drag-and-drop only the created by you securities into any folder as well as create your own folders. Belonging of the security to an asset class is set within 'Details' under the Classification tab where you can type in your own classification (user-defined). When adding the security to a portfolio, you may choose between these variants (AW, firm, user-defined).

SEARCH

When the Search tab is selected, you can search the list for asset classes/securities by name or by ticker.

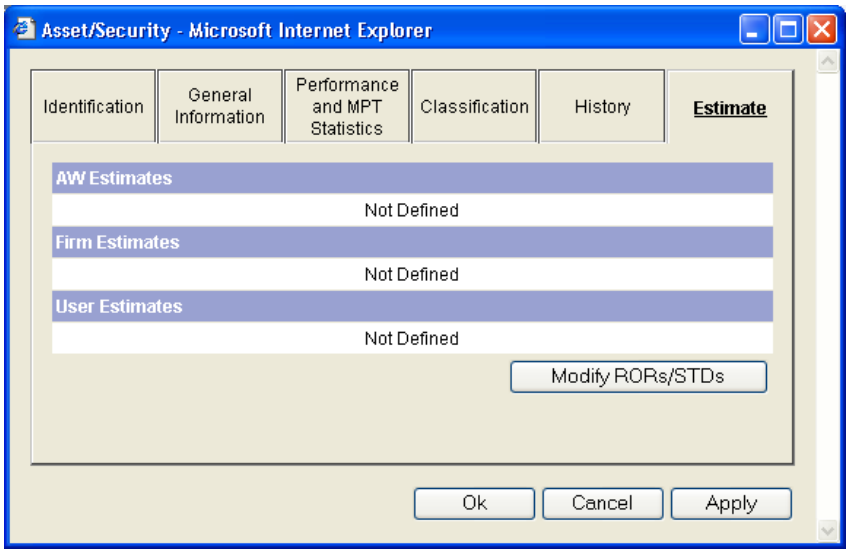
Search by name:

Type in the name you wish to find and click the 'Search' button. As a result, the list below will display all the items containing the word or sequence of characters you have typed.

Search by ticker:

Type in the ticker of the item you wish to find and click the 'Search' button. As a result, if such ticker exists in the list, the corresponding item will be displayed below. To search for multiple tickers, separate the entries by commas.

MODIFYING ASSET/SECURITY RATES OF RETURN AND STANDARD DEVIATIONS



To modify RORs and/or STDs for ALL portfolios:

1. Click on '**Assets & Securities'**
2. select the asset or security to be modified
3. click on '**Details'**
4. click on the Estimates tab
5. click on '**Modify RORs/STDs'**
6. enter or change the ROR or STD.
7. to apply these values, click on '**My Estimates'** under **History/Estimates**.

OR

1. display the securities assigned to an Asset Class by clicking on the check box next to the Asset Class
2. click on the Estimates tab
3. click on '**Modify RORs/STDs'**
4. enter or change the ROR or STD.
5. to apply these values, click on '**My Estimates'** under **History/Estimates**.

To modify RORs and/or STDs ONLY for the active portfolio:

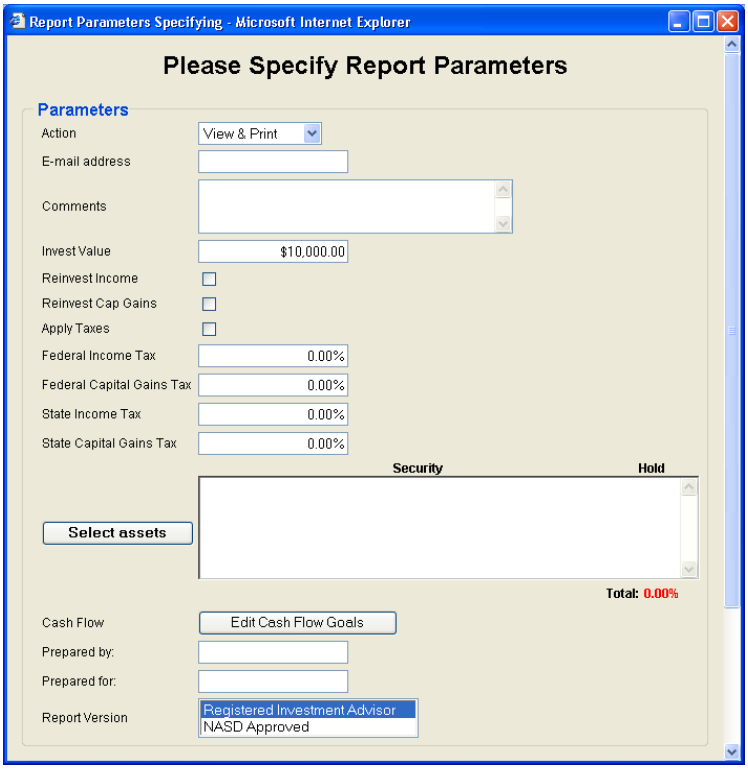
1. select and load a portfolio
2. highlight (click on) the ROR or STD field for the Asset Class or Security desired
3. enter the new value
4. type the 'tab' or 'enter' key; or click on another asset; or another part of the screen

SECURITY ANALYSIS

HYPOTHETICAL PERFORMANCE

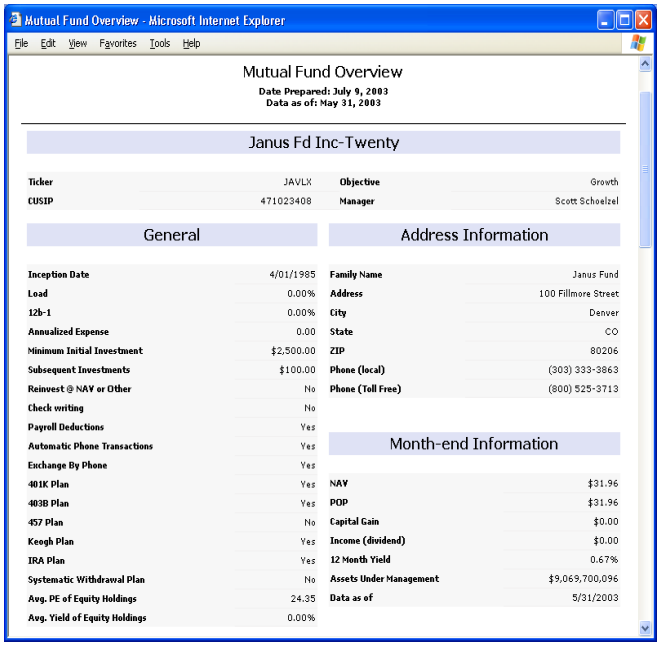
Calculates and displays the hypothetical performance of a portfolio of funds, stocks and variable annuities or for individual funds, stocks and variable annuities.

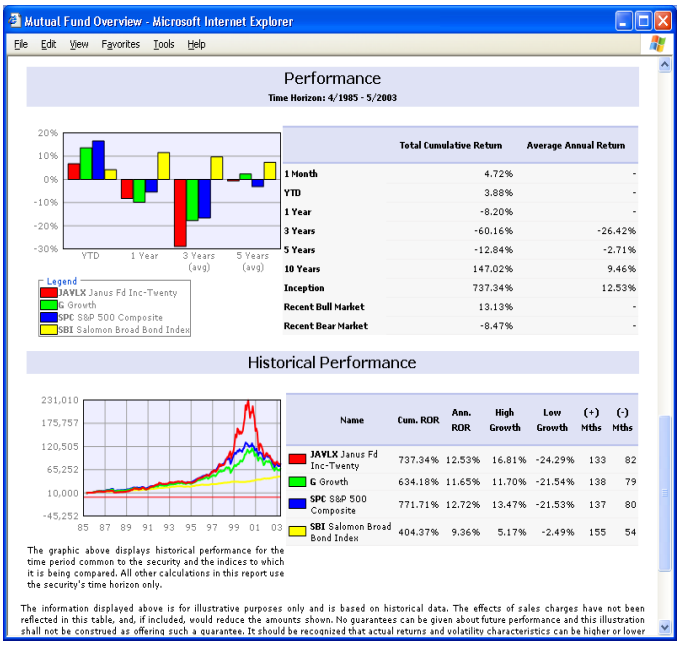
- Set the assumptions to be used in the hypothetical performance such as taxes, reinvestment of dividends/interest and capital gains, detailed cash flows, and transaction fees. Users can specify a Prepared By (advisor)and a Prepared For (client).
- Select the security or securities to be reviewed and establish any additional cash flows such as periodic contributions to be applied.
- When finished, click on Continue.



OVERVIEW

Calculates and displays an overview of a mutual fund, stock or variable annuity.




Mutual Fund Overview - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Performance
Time Horizon: 4/1985 - 5/2003
Total Cumulative Return
Average Annual Return
1 Month 4.72% -
YTD 3.88% -
1 Year -8.20% -
3 Years -60.16% -26.42%
5 Years -12.84% -2.71%
10 Years 147.02% 9.46%
Inception 737.34% 12.53%
Recent Bull Market 13.13% -
Recent Bear Market -8.47% -
Historical Performance
Name Cum. ROR Ann. ROR High Growth Low Growth (+) Mths (-) Mths
JAVLX Janus Fd Inc-Twenty 737.34% 12.53% 16.81% -24.29% 133 82
G Growth 634.18% 11.65% 11.70% -21.54% 138 79
SPC S&P 500 Composite 771.71% 12.72% 13.47% -21.53% 137 80
SBI Salomon Broad Bond Index 404.37% 9.36% 5.17% -2.49% 155 54
The graphic above displays historical performance for the time period common to the security and the indices to which it is being compared. All other calculations in this report use the security's time horizon only.
The information displayed above is for illustrative purposes only and is based on historical data. The effects of sales charges have not been reflected in this table, and, if included, would reduce the amounts shown. No guarantees can be given about future performance and this illustration shall not be construed as offering such a guarantee. It should be recognized that actual returns and volatility characteristics can be higher or lower

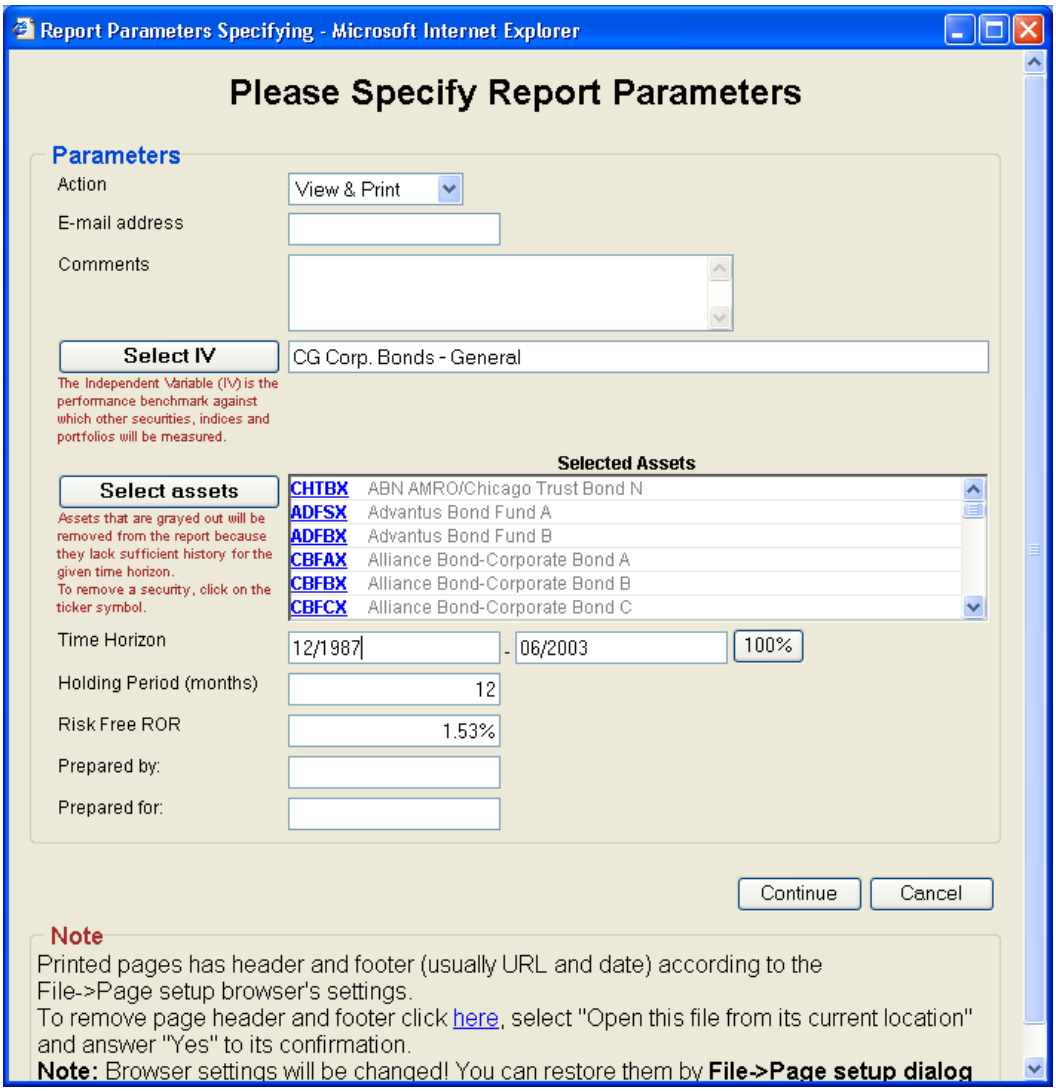
FACTOR ANALYSIS

The Factor Analysis application allows users to find those funds and/or securities that will match the benchmark characteristics established for the portfolio. Failure to do this will mean that the asset allocation process will not be effective.

Performance Overview

Calculates and displays performance characteristics for mutual funds, stocks, variable annuities compared to an Independent Variable (i.e. index, security or portfolio). Calculated values include betas, alphas, correlation coefficients, RORs, STDs, Sharpe Ratio, R-squares, last 12 month ROR and risk-adjusted return.

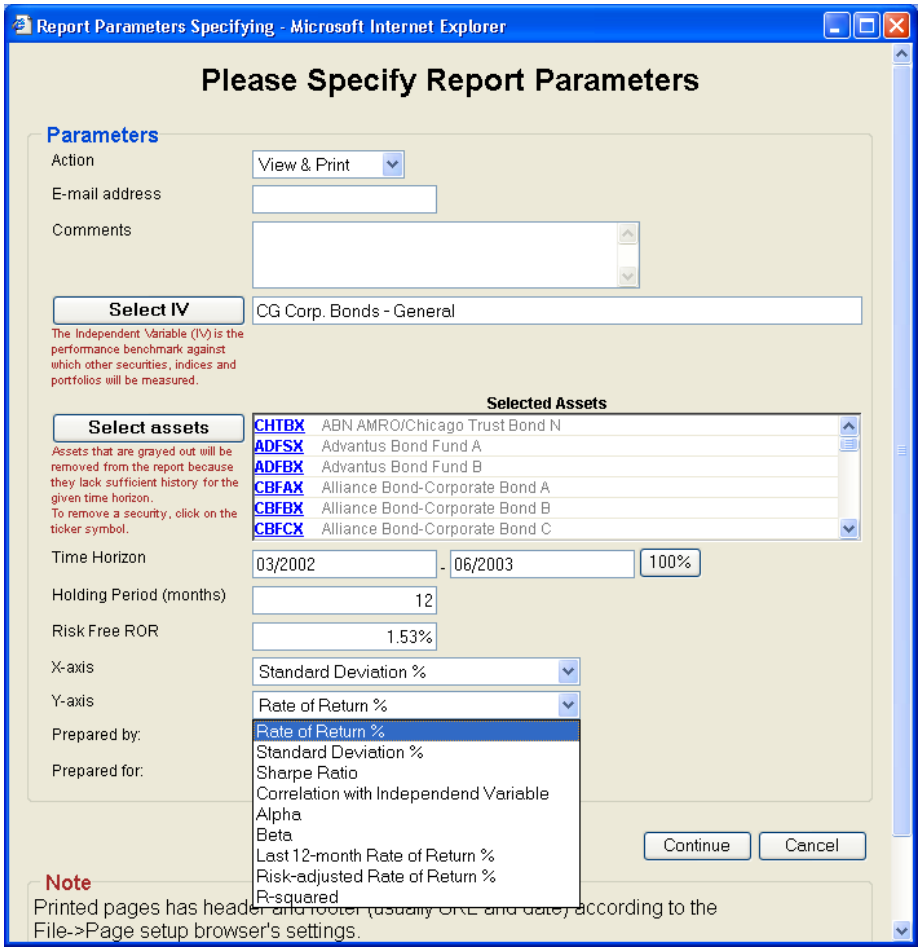
- To run this report, select Security Reports in the main screen.
- Select an independent variable (IV) which is the benchmark against which other securities, indices or portfolios will be measured. You can elect to "Add All In Class" as the securities to be measured against the IV, or select from all available databases using "Select Assets".
- Set the time horizon you wish to use, the holding period (i.e. 12 months, 36 months) and use your own or the historical risk-free rate of return.
- To run the report, click on "Continue".
- While the report is displayed you can modify any setting, add or remove securities by clicking on the "Edit Report" button at the top of the report.


Report Parameters Specifying - Microsoft Internet Explorer
Please Specify Report Parameters
Parameters
Action
View & Print
E-mail address
Comments
Select IV
CG Corp. Bonds - General
The Independent Variable (IV) is the performance benchmark against which other securities, indices and portfolios will be measured.
Selected Assets
Select assets
Assets that are grayed out will be removed from the report because they lack sufficient history for the given time horizon.
To remove a security, click on the ticker symbol.
CHTBX ABN AMRO/Chicago Trust Bond N
ADFSX Advantus Bond Fund A
ADFBX Advantus Bond Fund B
CBFAX Alliance Bond-Corporate Bond A
CBFBX Alliance Bond-Corporate Bond B
CBFCX Alliance Bond-Corporate Bond C
Time Horizon
12/1987
06/2003
100%
Holding Period (months)
12
Risk Free ROR
1.53%
Prepared by:
Prepared for:
Continue
Cancel
Note
Printed pages has header and footer (usually URL and date) according to the File->Page setup browser's settings.
To remove page header and footer click here, select "Open this file from its current location" and answer "Yes" to its confirmation.
Note: Browser settings will be changed! You can restore them by File->Page setup dialog

Scatter Graph

Displays the performance of securities in risk/return terms (X & Y axis). Users can change X&Y values and sort columns.

- To run this report, select Security Reports in the main screen.
- Select an independent variable (IV) which is the benchmark against which other securities, indices or portfolios will be measured. You can elect to "Add All In Class" as the securities to be measured against the IV, or select from all available databases using "Select Assets".
- Set the time horizon you wish to use, the holding period (i.e. 12 months, 36 months) and use your own or the historical risk-free rate of return.
- To run the report, click on "Continue".
- You can set or change the parameters for the X and Y axis if desired.
- While the report is displayed you can modify any setting, add or remove securities by clicking on the "Edit Report" button at the top of the report.



Growth of A Dollar

Graphs the performance of securities or indices for a specified time horizon.

- To run this report, select Security Reports in the main screen.
- Click on "Select Assets". You can choose an index and "Add All In Class", or select from all available databases using "Select Assets".
- Set the time horizon you wish to use, the holding period (i.e. 12 months, 36 months) and use your own or the historical risk-free rate of return.
- To run the report, click on "Continue".

- While the report is displayed you can modify any setting, add or remove securities by clicking on the “Edit Report” button at the top of the report.

Monthly/Annual Performance

Displays the monthly and annual rate of returns for any security or index.

- To run this report, select Security Reports in the main screen.
- Click on “Select Assets”. You can choose an index and “Add All In Class”, or select from all available databases using “Select Assets”.
- Set the time horizon you wish to use, the holding period (i.e. 12 months, 36 months) and use your own or the historical risk-free rate of return.
- To run the report, click on “Continue”.
- While the report is displayed you can modify any setting, add or remove securities by clicking on the “Edit Report” button at the top of the report.

Rolling Period Returns

Displays graphically the rolling period performance of securities or indices for any holding period and time horizon.

- To run this report, select Security Reports in the main screen.
- Click on “Select Assets”. You can choose an index and “Add All In Class”, or select from all available databases using “Select Assets”.
- Set the time horizon you wish to use, the holding period (i.e. 12 months, 36 months) and use your own or the historical risk-free rate of return.
- To run the report, click on “Continue”.
- While the report is displayed you can modify any setting, add or remove securities by clicking on the “Edit Report” button at the top of the report.

Definitions:

Betas indicate how each asset/manager (dependent variable) has or should perform in relation to movement by the primary index (independent variable). Beta is the "slope" of the regression line or the amount of change on the vertical axis (dependent variable return) per unit of change on the horizontal axis (independent variable return). A Beta greater than 1.0 indicates a higher level of risk and an expected change of value in excess of that experienced by the primary index (independent variable).

Alpha is the "intercept" of the regression line, where the line crosses the vertical axis and zero on the horizontal axis. The Alpha indicates the change in value for an asset/manager (dependent variable) which is independent (or unrelated) to a change in value for the primary index (independent variable).

The **correlation** coefficient of two assets is a quantitative measure of the timing and direction of the movements of the assets. A positive correlation means that the assets are moving in the same direction at the same time. A negative correlation coefficient indicates that one asset is increasing in value when the other is declining in value.

The **Sharpe Ratio** is a measure of how much additional return can be expected for every unit increase in risk. The higher the number the more efficient the security/portfolio tends to be by providing more return per unit of risk taken.

R-squared measures the proportion of a security’s total variance that is market related. The closer the historical performance the higher the number.

The **mean returns** represent the "average" return for all of those rolling time periods (January to January, February to February and so on) in the time horizon specified. For example, during a 10-year time horizon there are 108 one-year holding periods and calculations.

Standard deviation is a measure of volatility, i.e. a relative measure of how frequently actual results varied from the mean rate of return for a given historic time period. One standard deviation will include 68.4% of all observations within the dispersed population of results. The wider the spread of measurements within one

standard deviation, the greater the variability of returns. Therefore, the greater the historic variability from the mean rate of return, the greater the risk associated with the investment.

Risk-adjusted Performance indicates the expected (mean) rate of return and the actual rate of return experienced over the past 12 months.

Cumulative Rate of Return displays the holding period return for the time horizon specified.

Annualized Rate of Return displays the annualized rate of return for the number of 12 month periods within the time horizon specified.

High Growth Rate displays the highest historical 12 month rate of return experienced during the time horizon specified.

Low Growth Rate displays the lowest historical 12 month rate of return experienced during the time horizon specified.

Number of Positive Periods indicates how many historical rolling 12 months periods experienced positive growth.

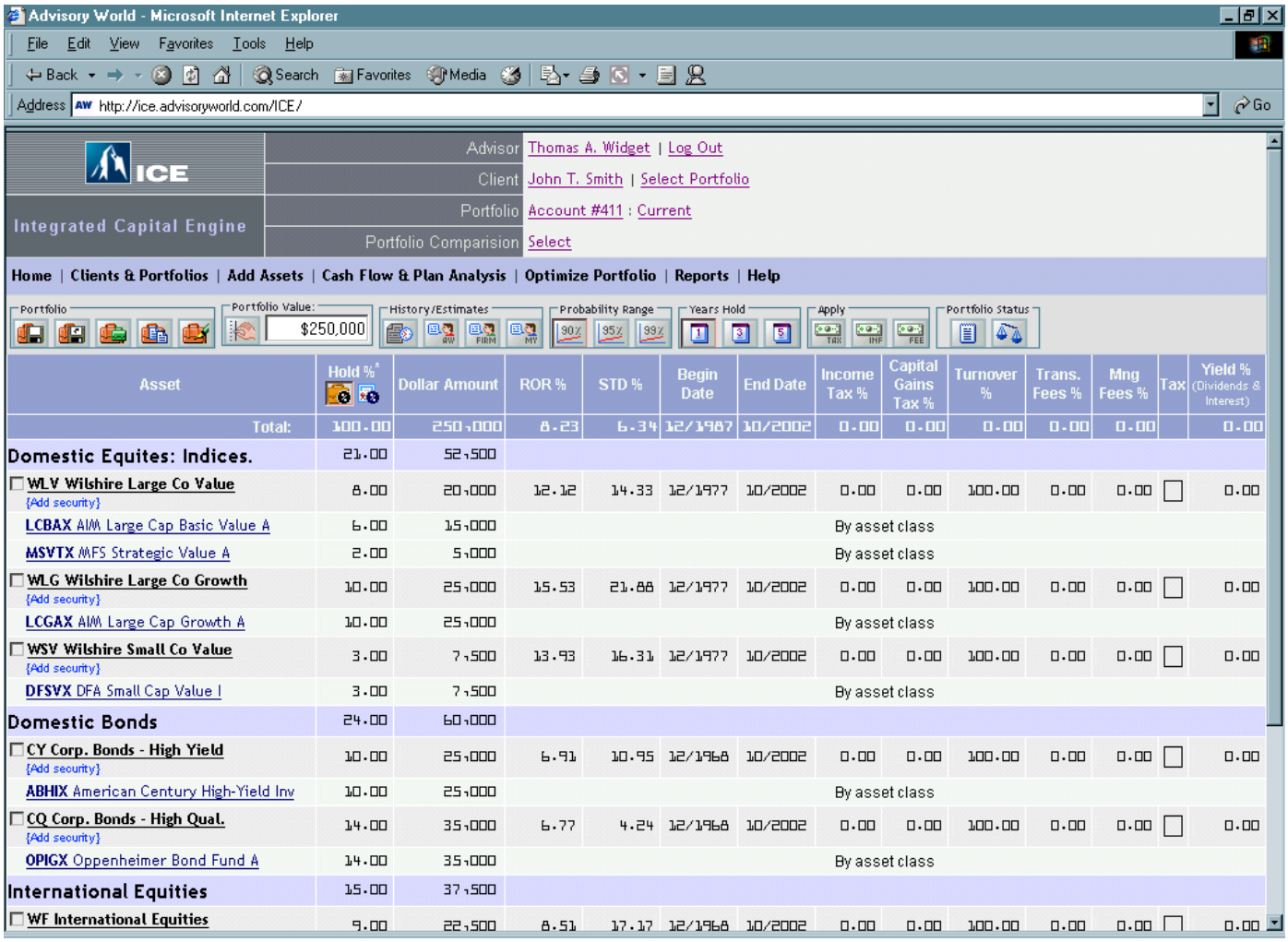
Number of Negative Periods indicates how many historical rolling 12 months periods experienced negative growth.

BUILDING PORTFOLIOS

Note: ***Do not leave the Portfolio Builder page by using the browser's navigation buttons (Home, Back, Forward) and do not quit the browser without having the portfolio saved. Otherwise, all your changes will be lost. To properly quit the Portfolio Builder, use the 'Home' link only. In this case, you will be prompted to save the portfolio.***

The Portfolio Builder page is where you see the portfolio calculation results and perform required adjustments.

- For detailed information on any asset type, asset class or security, simply click on that object.
- To view assigned securities, simply click on the "plus sign" at the left of the Asset Class name.


Advisory World - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://ice.advisoryworld.com/ICE/
Go
ICE
Integrated Capital Engine
Advisor Thomas A. Widget | Log Out
Client John T. Smith | Select Portfolio
Portfolio Account #411 : Current
Portfolio Comparision Select
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help
Portfolio
Portfolio Value: $250,000
History/Estimates
Probability Range
Years Hold
Apply
Portfolio Status

Asset	Hold %*	Dollar Amount	ROR %	STD %	Begin Date	End Date	Income Tax %	Capital Gains Tax %	Turnover %	Trans. Fees %	Mng Fees %	Tax	Yield % (Dividends & Interest)
Total:	100.00	250,000	8.23	6.34	12/1987	10/2002	0.00	0.00	0.00	0.00	0.00		0.00
Domestic Equites: Indices.	21.00	52,500											
WLV Wilshire Large Co Value {Add security}	8.00	20,000	12.12	14.33	12/1977	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00
LCBAX AIM Large Cap Basic Value A	6.00	15,000					By asset class						
MSVTX MFS Strategic Value A	2.00	5,000					By asset class						
WLG Wilshire Large Co Growth {Add security}	10.00	25,000	15.53	21.88	12/1977	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00
LCGAX AIM Large Cap Growth A	10.00	25,000					By asset class						
WSV Wilshire Small Co Value {Add security}	3.00	7,500	13.93	16.31	12/1977	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00
DFSVX DFA Small Cap Value I	3.00	7,500					By asset class						
Domestic Bonds	24.00	60,000											
CY Corp. Bonds - High Yield {Add security}	10.00	25,000	6.91	10.95	12/1968	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00
ABHIX American Century High-Yield Inv	10.00	25,000					By asset class						
CQ Corp. Bonds - High Qual. {Add security}	14.00	35,000	6.77	4.24	12/1968	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00
OPIGX Oppenheimer Bond Fund A	14.00	35,000					By asset class						
International Equities	15.00	37,500											
WF International Equities	9.00	22,500	8.51	17.17	12/1968	10/2002	0.00	0.00	100.00	0.00	0.00	☐	0.00

ADDING ASSETS & SECURITIES

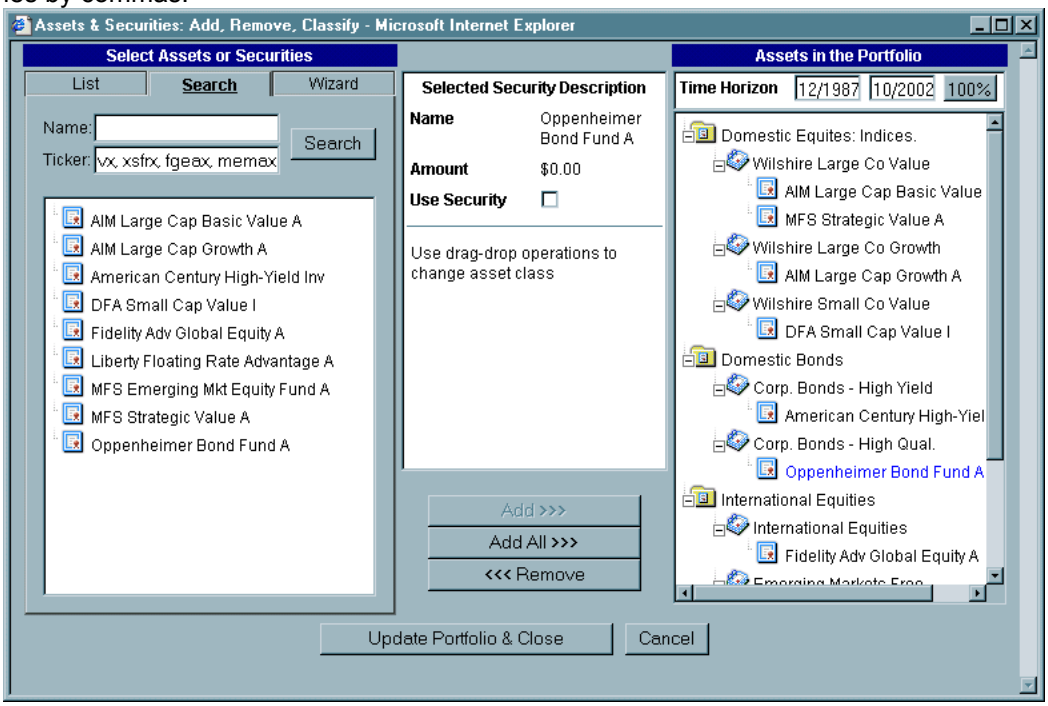
1. To add assets/securities to the portfolio, choose 'Add Assets & Securities' from the menu bar.
2. The 'Assets & Securities: Add, Remove, Classify' window appears on top. The left part of this window represents the list of available Assets/Securities. In the right part, you see those Assets/Securities that are already present in the portfolio.
3. Select an asset/security in the left dialog's pane and double click on the security or click on the 'Add' button.
4. To remove an asset/security from the portfolio select it in the right pane and click on the 'Remove' button.
5. When the Search tab is selected, you can search the list for asset classes/securities by name or by ticker.

   Search by name:

   Type in the name you wish to find and click the 'Search' button. As a result, the list below will display all the items containing the word or sequence of characters you have typed.

   Search by ticker:

   Type in the ticker of the item you wish to find and click the 'Search' button. As a result, if such ticker exists in the list, the corresponding item will be displayed below. To search for multiple tickers, separate the entries by commas.



An asset class is added to the portfolio under the asset type to which it has been assigned in the Assets/Securities dialog (See also Classifying asset classes). You can also move by drag-n-drop an asset class to another asset type within given portfolio (in the dialog's right panel).

When adding a security, you will be prompted to choose between those asset classes defined for this security by AW, Firm or you personally. If only one was defined, it will be automatically used. If no classes were defined for the security, you will be prompted to choose between the asset classes available in the portfolio. A security can be moved by drag-n-drop to another asset class within any given portfolio (in the dialog's right panel).

USING A SECURITY'S HISTORICAL PERFORMANCE

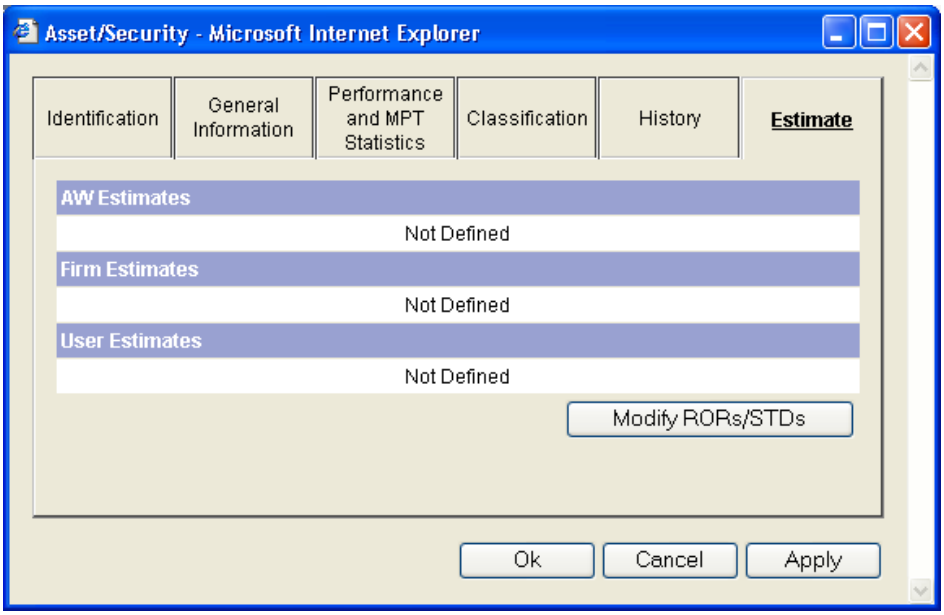
When a security is selected in the portfolio (the right pane), check the 'Use Security' checkmark in the 'Selected Security Description' (middle pane) to use its performance data in portfolio calculations rather than its asset class data.

REVIEWING AND SETTING THE HISTORICAL TIME HORIZON FOR A PORTFOLIO

The Time Horizon of the portfolio is represented in the upper part of the right panel. Choosing the '100%' button will set the Time Horizon to the widest available one.

After you have finished editing within this window, choose 'Update Portfolio & Close' to apply changes to the portfolio, or 'Cancel' - to cancel changes.

MODIFYING ASSET/SECURITY RATES OF RETURN AND STANDARD DEVIATIONS



To modify RORs and/or STDs for ALL portfolios:

8. Click on '**Assets & Securities**'
9. select the asset or security to be modified
10. click on '**Details**'
11. click on the Estimates tab
12. click on '**Modify RORs/STDs**'
13. enter or change the ROR or STD.
14. to apply these values, click on '**My Estimates**' under **History/Estimates**.

OR

6. display the securities assigned to an Asset Class by clicking on the check box next to the Asset Class
7. click on the Estimates tab
8. click on '**Modify RORs/STDs**'
9. enter or change the ROR or STD.
10. to apply these values, click on '**My Estimates**' under **History/Estimates**.

*Note: Using this method, modified RORs and STDs will not be applied until you exit the Portfolio Builder screen and re-open the portfolio.

To modify RORs and/or STDs ONLY for the active portfolio:

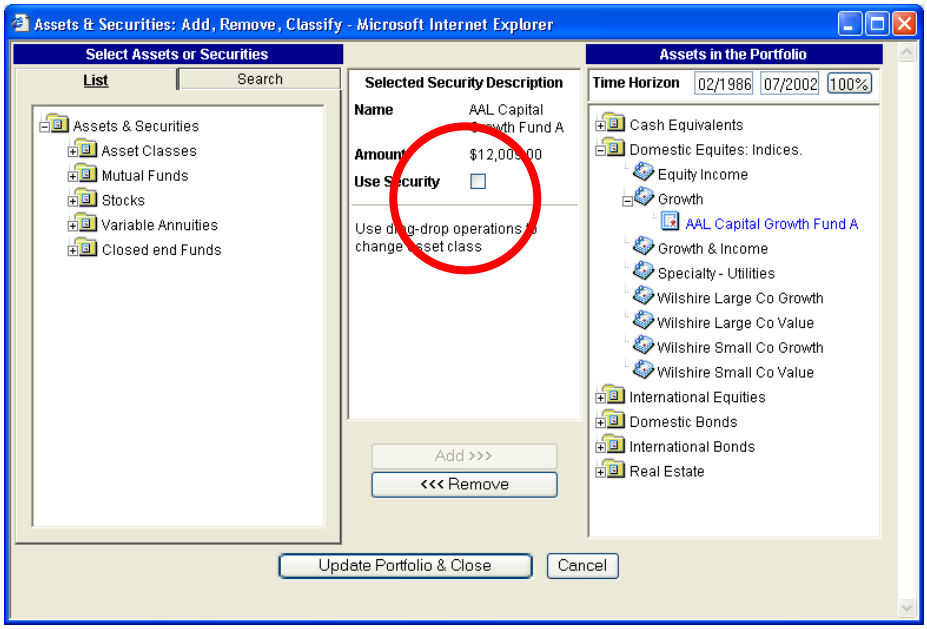
5. select and load a portfolio
6. highlight (click on) the ROR or STD field for the Asset Class or Security desired
7. enter the new value
8. type the 'tab' or 'enter' key; or click on another asset; or another part of the screen

USING ASSET CLASS OR SECURITY RORS

Asset Class RORs are the default. To use a Security ROR:

1. Select Add Assets & Securities
2. In the box on the right hand side, find the security you want and click on it.
3. In the box in the middle, check the box "**Use Security**"
4. Click on "**Update Portfolio**"

Note: The combined % holding of all assigned securities will be equal to 100% of the Asset Class holding.

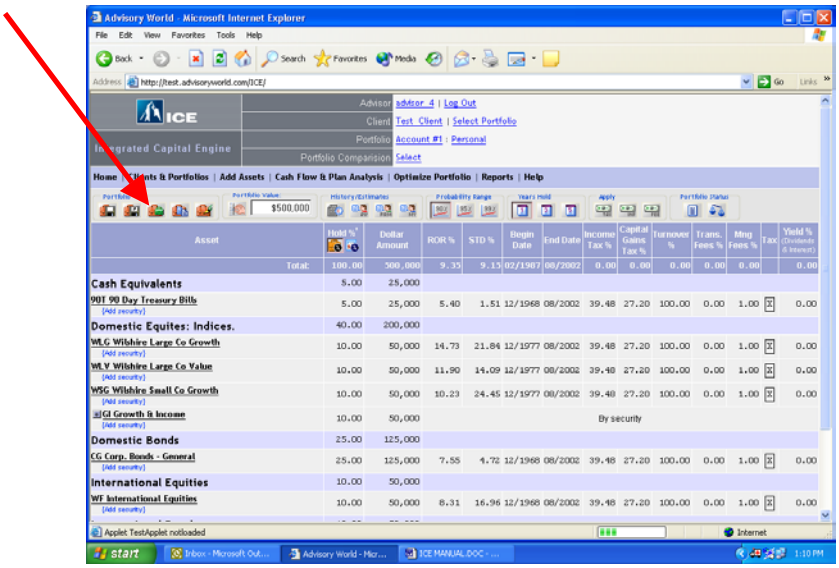


CREATING NEW PORTFOLIOS

1. Create a new portfolio using the **'New Portfolio'** function
2. Save and go to the **Portfolio Builder** screen
3. Choose the 'Combine Portfolios' button on the toolbar.
4. The 'Combine Portfolio' dialog window appears on top.
5. In the left part of the window you see the list of available portfolios, which can be added to the current portfolio represented on the dialog's right.

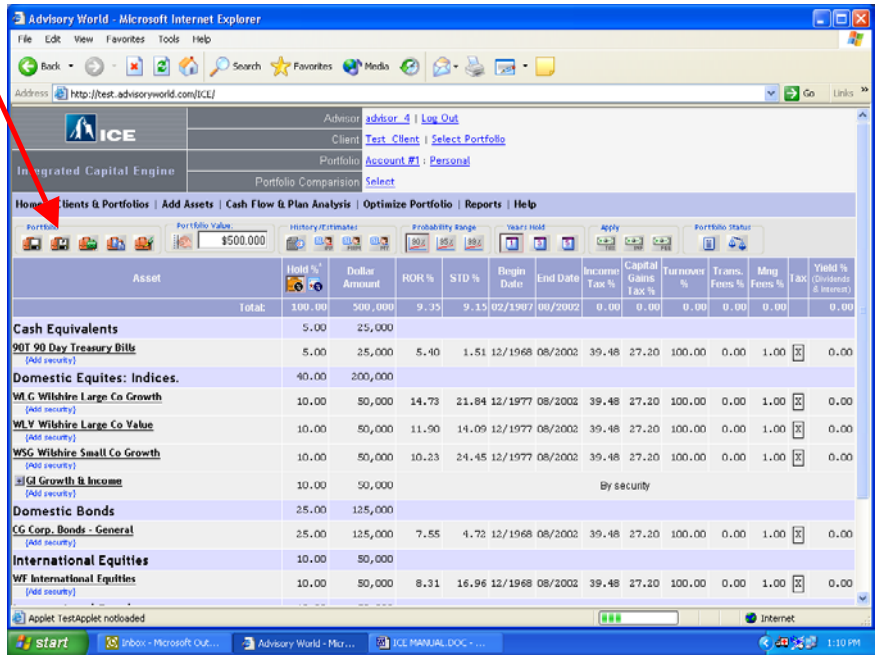
COPY/COMBINE AN EXISTING PORTFOLIO WITH OTHER PORTFOLIOS

1. Choose the **'Combine Portfolios'** button on the toolbar.
2. The 'Combine Portfolio' dialog window appears on top.
3. In the left part of the window you see the list of available portfolios, which can be added to the current portfolio represented on the dialog's right.



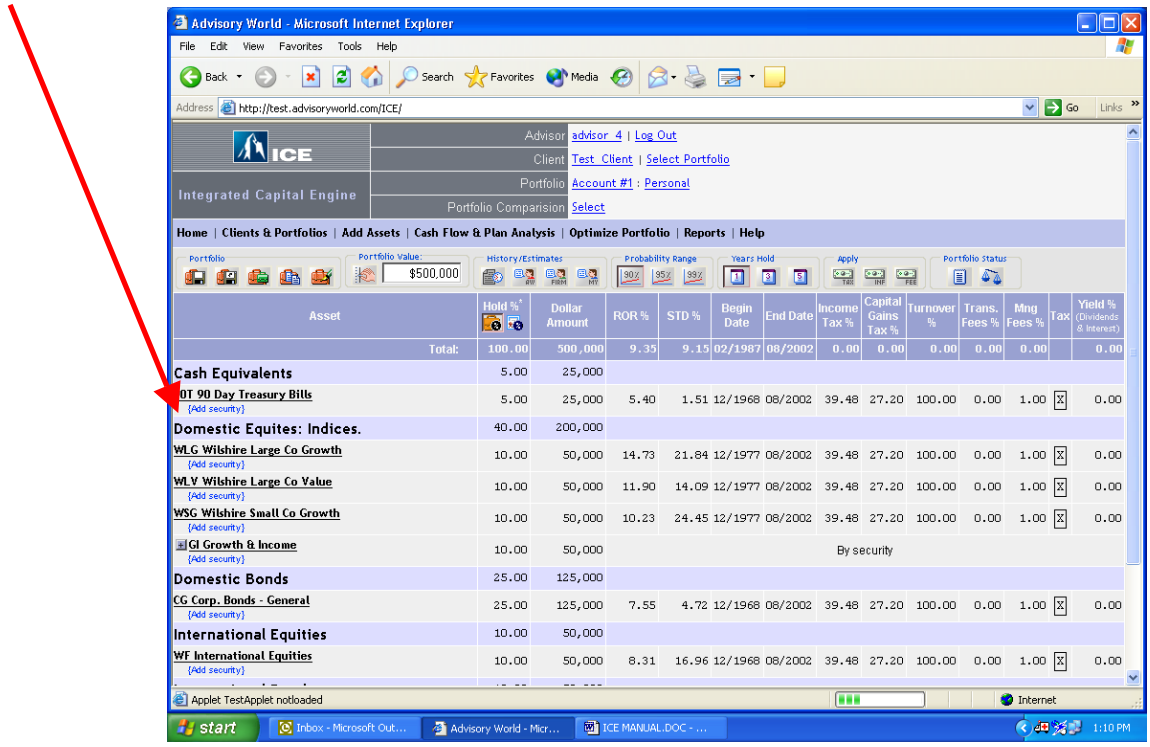
COPYING RECOMMENDED OR MODEL PORTFOLIOS

You can replace the contents of your current portfolio with those recommended (by AW, Firm, or You) for the portfolio objective. Choose the **'Copy Recommended Portfolio'** button in the 'Portfolio' section on the toolbar.



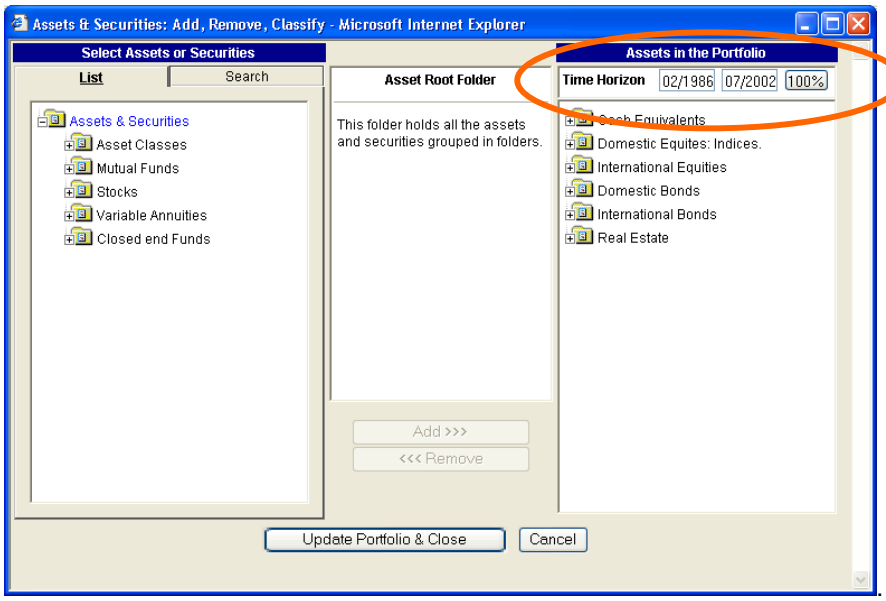
ASSIGNING SECURITIES TO ASSET CLASSES

1. Click on the **'Add Security'** link under the asset class name.
2. The 'Assets & Securities: Add, Remove, Classify' window appears on top where you can add securities to the current asset class.
3. You can define which securities to show in the left part of the window by choosing one of the radio buttons (ALL or recommended for this asset class by AW's, Firm's or Yours).


Advisory World - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.advisoryworld.com/ICE/
ICE
Integrated Capital Engine
Advisor advisor_4 | Log Out
Client Test_Client | Select Portfolio
Portfolio Account #1 : Personal
Portfolio Comparision Select
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help
Portfolio Value: $500,000
Asset
Hold %
Dollar Amount
ROR %
STD %
Begin Date
End Date
Income Tax %
Capital Gains Tax %
Turnover %
Trans. Fees %
Mng Fees %
Tax
Yield % (Dividends & Interest)
Total: 100.00 500,000 9.35 9.15 02/1987 08/2002 0.00 0.00 0.00 0.00 0.00 0.00
Cash Equivalents 5.00 25,000
OT 90 Day Treasury Bills {Add security} 5.00 25,000 5.40 1.51 12/1968 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
Domestic Equites: Indices. 40.00 200,000
WLG Wilshire Large Co Growth {Add security} 10.00 50,000 14.73 21.84 12/1977 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
WLV Wilshire Large Co Value {Add security} 10.00 50,000 11.90 14.09 12/1977 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
WSG Wilshire Small Co Growth {Add security} 10.00 50,000 10.23 24.45 12/1977 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
GI Growth & Income {Add security} 10.00 50,000 By security
Domestic Bonds 25.00 125,000
CG Corp. Bonds - General {Add security} 25.00 125,000 7.55 4.72 12/1968 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
International Equities 10.00 50,000
WF International Equities {Add security} 10.00 50,000 8.31 16.96 12/1968 08/2002 39.48 27.20 100.00 0.00 1.00 X 0.00
Applet TestApplet notloaded
Internet
start
Inbox - Microsoft Out...
Advisory World - Micr...
ICE MANUAL.DOC - ...
1:10 PM

CHANGING PORTFOLIO TIME HORIZON

The portfolio time horizon may be changed in the 'Assets & Securities: Add, Remove, Classify' window



EDITING VALUES OF ASSETS/SECURITIES IN PORTFOLIO

You can change the values of assets/securities directly in the portfolio table. Just click on a line and input boxes will appear where you can type in. To unselect a line, click anywhere on the screen outside the table.

By clicking on the icons beneath 'Hold%' you can enter or review the % holdings as:

1. a percentage of the portfolio
2.
    a. asset Type as a % of the portfolio
    b. Asset Classes as a % of Asset Types
    c. Securities as a % of Asset Classes

SAVING PORTFOLIOS

Click on the **'Save Portfolio'** button in the **'Portfolio'** section on the toolbar to save the portfolio as is. Click on the "Save As" button to save the portfolio to another name. This function also allows you to save the portfolio to another client or account.

ADJUSTING PORTFOLIO VALUE

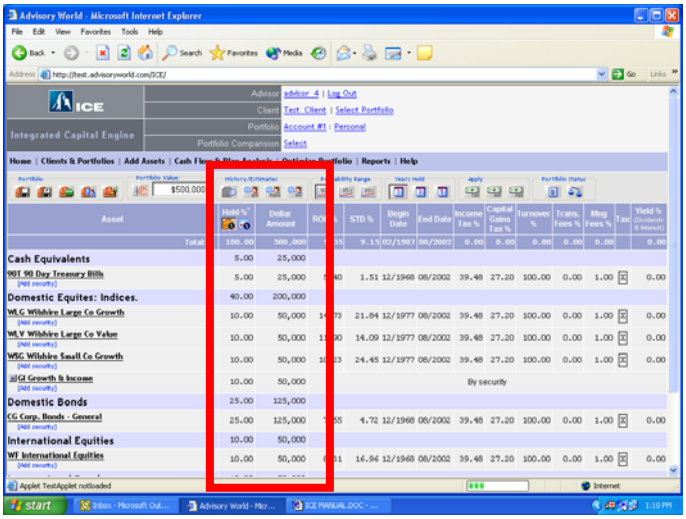
When you are editing values in the portfolio table, the total **'Hold %'** and/or **'Dollar amount'** may exceed the values set for a group (an asset class is a group of securities, asset type is a group of asset classes). In this case, the current group values will be highlighted (red on yellow) and when clicking outside the group the 'Adjust Value' dialog window will appear on top where you are prompted to choose among variants of how to adjust the group's value.

EDITING VALUES OF ASSETS/SECURITIES

Values can be changed directly in the portfolio table. Click on a line or the input box and enter your value(s). To unselect a lien, click anywhere on the screen outside of the table.

By clicking on the icons beneath 'Hold%' you can enter or review the % holdings as:

1. a percentage of the portfolio (left icon)
2.
   - asset type as a % of the portfolio
   - asset class as a % of the asset type
   - securities as a % of asset classes



If the current portfolio amount (the 'Total' line of the table) doesn't equal the value set for this portfolio (the 'Portfolio Value' text-box on the toolbar) then when trying to save the portfolio you will be prompted to adjust the value by choosing one of the variants. The **'Adjust Portfolio Value'** dialog may also be opened by choosing the 'Adjust Portfolio Value' button left to the 'Portfolio Value' text-box. You can also modify the designated portfolio value directly within this page by typing in the 'Portfolio Value' text-box.

SETTING VALUES GLOBALLY

Choose the **'Set Values Globally'** button on the toolbar. The appeared dialog allows you to 'globally' change values in the portfolio. Globally, meaning to change values in the whole portfolio, in the current line, or in the asset class or asset type the current line belongs to. Just enter the values that you want to globally apply.

APPLYING HISTORICAL RETURNS, ADVISORYWORLD ESTIMATES, FIRM ESTIMATES OR USER ESTIMATES

Choose appropriate button in the **'History/Estimates'** section on the toolbar. Corresponding values of ROR and STD will be applied to the current line or to the whole portfolio if no line is selected.

INCOME & CAPITAL GAINS TAXES

Income to a security or asset class is the amount specified as the Yield. Income taxes will be applied to this value and capital gains taxes will be applied to the remainder of the total return. If no Yield is specified, then the entire amount of the return will be taxed at capital gains rates. For example:

Total Return	=	10%	
Yield (Income)	=	5%	(income taxes are applied to this amount
Capital Gain	=	5%	(capital gains taxes are applied to this amount)

TRANSACTION FEES

Transaction fees can be applied to the first purchase (beginning value) of a security or to all future transactions (buys and sells) of a security. For example, in Cash Flow and Financial Plan Analysis, if you set the portfolio to rebalance and elect to apply transaction fees to all future transactions, then every time the securities are turned over (bought/sold), a transaction fee will be applied to the purchase for cash flow purposes.

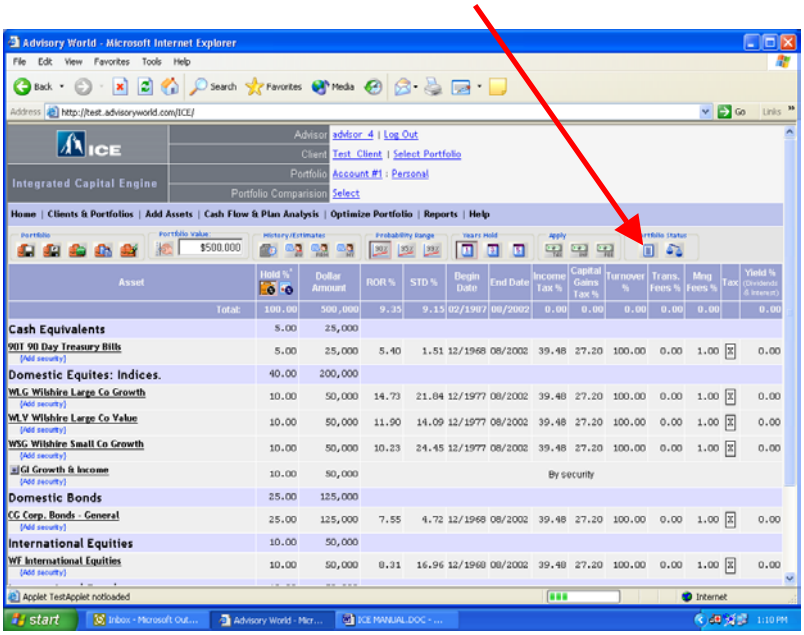
CHANGING PORTFOLIO ANALYSIS OPTIONS

Choose one of the buttons in the **'Portfolio Range**' section on the toolbar to select corresponding confidence level of the portfolio.

Choose one of the buttons in the 'Years Hold' section on the toolbar to select corresponding holding period of the portfolio.
You can define whether to apply taxes, inflation rate or management fees for the portfolio analysis by choosing corresponding button in the 'Apply' section on the toolbar.

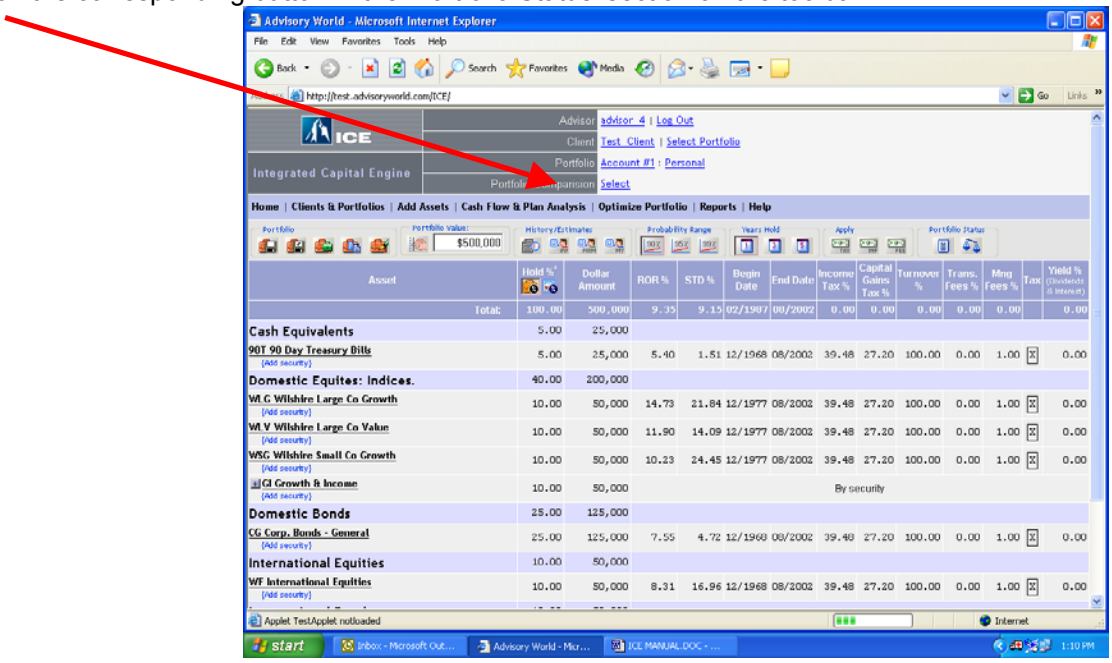
PORTFOLIO STATUS

Choosing the **'Show Portfolio Status'** button in the 'Portfolio Status' section on the toolbar opens the 'Portfolio Status' window. Within this draggable window, you can view the portfolio analysis results.


Advisory World - Microsoft Internet Explorer
Integrated Capital Engine
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help

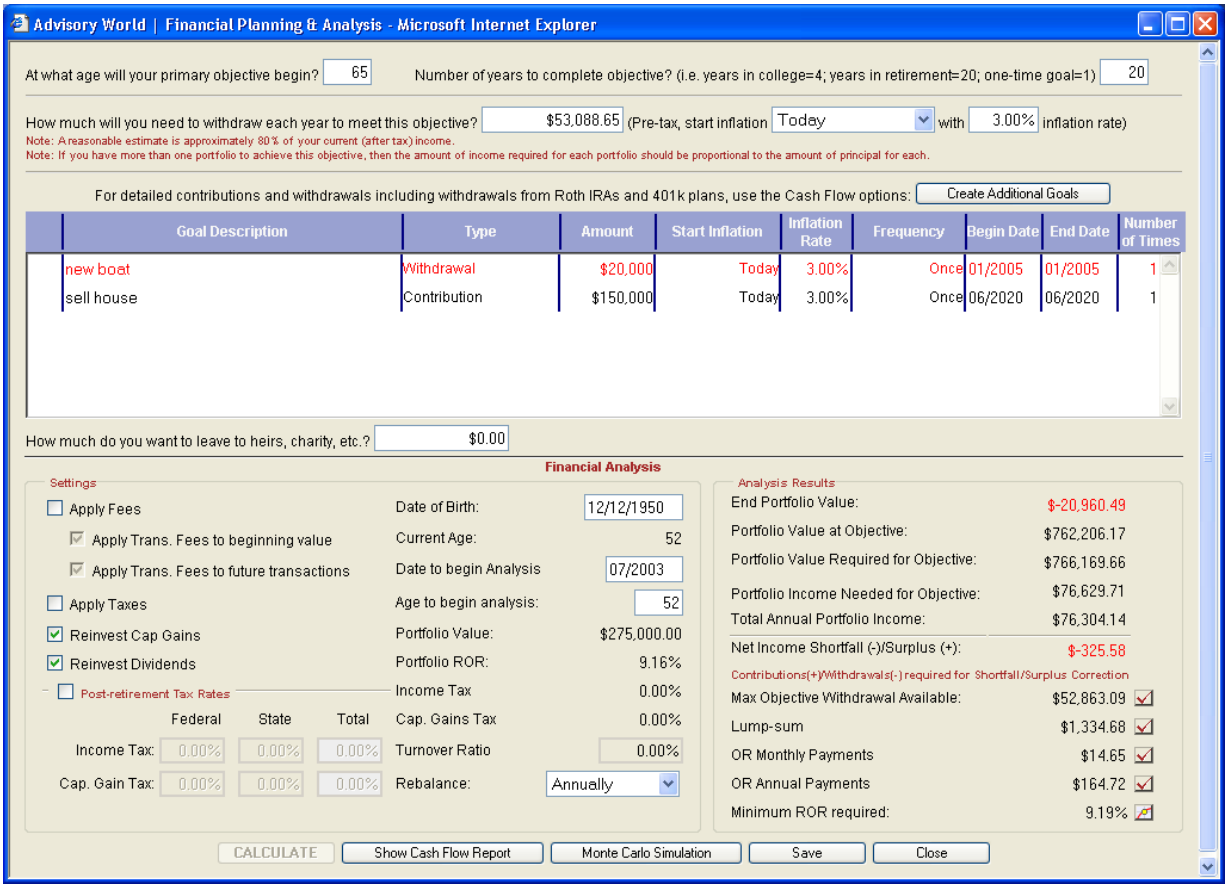
COMPARING PORTFOLIOS

You can compare your portfolio to one of the existed portfolios. Choose the 'Select' link in the **'Portfolio to compare'** section. In the Select Portfolio window, choose a portfolio to compare. In the **'Portfolio Status'** window, you will see the status of the compared portfolio. You can hide/show the status of the compared portfolio by clicking on the corresponding button in the 'Portfolio Status' section on the toolbar.


Advisory World - Microsoft Internet Explorer
Integrated Capital Engine
Home | Clients & Portfolios | Add Assets | Cash Flow & Plan Analysis | Optimize Portfolio | Reports | Help

FINANCIAL PLAN ANALYSIS
(set financial goals and make necessary changes to achieve those goals)

The **Financial Plan Analysis** feature is an extremely powerful tool for determining if your investment strategy will achieve the client's stated financial objectives (i.e. college, retirement, major purchase or investment). Set the date (age) at which the client expects to achieve a goal, the amount of capital to be withdrawn, the period over which it will be withdrawn, whether to inflate this withdrawal, any additional cash flows that may occur prior to and after reaching this goal as well as any cash flows that might affect whether or not the client will achieve the goal, including reinvesting dividends (interest) and capital gains. Cash flows can include items such as college, buying a new boat, leisure activities, sale of a house, investment in a new business, sale of a business, post-retirement expenses, etc. The Cash Flow report gives a detailed picture of the portfolio cash flows for any time horizon (i.e. now until death). The analysis shows whether or not the goal will be achieved, and if not, it will offer some solutions including lump-sum. monthly and annual contributions. You may then modify any of approximately 20 different variables to review how changes in these variables will affect the client's chances of reaching the stated objective.


Advisory World | Financial Planning & Analysis - Microsoft Internet Explorer
At what age will your primary objective begin? 65
Number of years to complete objective? (i.e. years in college=4; years in retirement=20; one-time goal=1) 20
How much will you need to withdraw each year to meet this objective? $53,088.65 (Pre-tax, start inflation Today with 3.00% inflation rate)
Note: A reasonable estimate is approximately 80% of your current (after tax) income.
Note: If you have more than one portfolio to achieve this objective, then the amount of income required for each portfolio should be proportional to the amount of principal for each.
For detailed contributions and withdrawals including withdrawals from Roth IRAs and 401k plans, use the Cash Flow options: Create Additional Goals
Goal Description | Type | Amount | Start Inflation | Inflation Rate | Frequency | Begin Date | End Date | Number of Times
new boat | Withdrawal | $20,000 | Today | 3.00% | Once | 01/2005 | 01/2005 | 1
sell house | Contribution | $150,000 | Today | 3.00% | Once | 06/2020 | 06/2020 | 1
How much do you want to leave to heirs, charity, etc.? $0.00
Financial Analysis
Settings
Apply Fees
Apply Trans. Fees to beginning value
Apply Trans. Fees to future transactions
Apply Taxes
Reinvest Cap Gains
Reinvest Dividends
Post-retirement Tax Rates
Federal State Total
Income Tax: 0.00% 0.00% 0.00%
Cap. Gain Tax: 0.00% 0.00% 0.00%
Date of Birth: 12/12/1950
Current Age: 52
Date to begin Analysis 07/2003
Age to begin analysis: 52
Portfolio Value: $275,000.00
Portfolio ROR: 9.16%
Income Tax 0.00%
Cap. Gains Tax 0.00%
Turnover Ratio 0.00%
Rebalance: Annually
Analysis Results
End Portfolio Value: $-20,960.49
Portfolio Value at Objective: $762,206.17
Portfolio Value Required for Objective: $766,169.66
Portfolio Income Needed for Objective: $76,629.71
Total Annual Portfolio Income: $76,304.14
Net Income Shortfall (-)/Surplus (+): $-325.58
Contributions(+)/Withdrawals(-) required for Shortfall/Surplus Correction
Max Objective Withdrawal Available: $52,863.09
Lump-sum $1,334.68
OR Monthly Payments $14.65
OR Annual Payments $164.72
Minimum ROR required: 9.19%
CALCULATE
Show Cash Flow Report
Monte Carlo Simulation
Save
Close

CASH FLOW & FINANCIAL PLAN ANALYSIS
Open the dialog devoted to analyzing the client's financial plan. Input the main objective data (at the screen's top) and other financial goals (contributions to and withdrawals from the portfolio the client is planning to do). To add a financial goal, choose the "**Create New Goal**" button. You can change the values of financial goals directly in the table. Just click on a line and input boxes will appear where you can type in. To unselect a line, click anywhere on the screen outside the table. To delete a line, select it by clicking and press the "Del" button.

At the screen's bottom you see the analysis options and results. To update results, click on the "**CALCULATE**" button.
Clicking on the "**Show Cash Flow Report**" button displays the "**Cash Flow Report**" within the analyzed period.

MODIFYING VARIABLES: GETTING THE INVESTMENT STRATEGY AND FINANCIAL GOALS INTO EQUILIBRIUM

If the results of the analysis show that there is a net "shortfall" it means that the current investment strategy (the portfolio) will not achieve the client's financial goals. To solve for this problem, you may modify any number of variables in the Financial Plan Analysis screen. For example, you could make lump-sum, monthly or annual payments, change the age of the objective, reduce the amount of money required to meet the objective, apply additional income that will be available, or modify the portfolio holdings to find a portfolio that will generate a higher rate of return.

HYPOTHETICAL PERFORMANCE - CASH FLOW & FINANCIAL PLAN ANALYSIS

Users can calculate the hypothetical historical performance of a portfolio and related cash flows for any period prior to the current date. The calculations use the portfolio's mean historical return in determining hypothetical past performance. For example, if you want to know how a portfolio and related cash flows might have performed if the client had made the investments 20 years before the current date, then change the "Date to begin analysis" or "Age to begin analysis" accordingly.

MONTE CARLO SIMULATION

Our unique Monte Carlo simulator is a very advanced mathematical model developed by Professor Giray Okten at the Dept of Mathematical Sciences of Ball State University.

To review the simulation, simply click on '**Monte Carlo Simulation'** button on the Financial Plan Analysis page.

- The simulation eliminates the problem of over concentration of probability runs by spreading iterations throughout the entire grid of normal distribution.
- The Monte Carlo calculations are based on the portfolio ROR (weighted security RORs), the portfolio standard deviation (volatility), cash flows (contributions and withdrawals) made prior to and during the time period required to meet the objective, the amount required to meet the objective(s), and the time period required to meet the objective(s).
- Determine the probability of growing a portfolio to a specified value by a pre-determined date or age.
- Determine the probability of achieving a goal(s) such as having sufficient capital after retirement to meet the investor's income requirements through mortality, or sending children through college.
- Review alternative strategies by quickly and easily modifying elements such as portfolio return, the age at which the objective will be met, the amount of income required, the length of time to complete the objective and many other variables.
- Review the actual time-weighted cash flows leading to completion of the investor's objective(s).
- The Monte Carlo Report is graphic and easy to understand and is a great marketing tool.

REPORTS

The pull-down list allows selecting required report or graph. Within the report window, you can use the following buttons: "Print" - to print a report. "Send" - to send a report to the client (receiver must use MS Outlook and have MS Internet Explorer v.5 or later installed on his PC). "Close" - to close the report window.

Besides, the "Cash Flow Report" window allows you to set the analysis period. Just input corresponding dates and choose "Recalc". You can also get a monthly or annual report by selecting appropriate radio button.

WIZARD

If you have already built a portfolio using assets and/or securities, the Wizard will help find alternative assets that might enhance the portfolio performance by increasing return or reducing volatility. You may choose any or all of these assets to add to the portfolio, recalculate and optimize.

To access this function:

a. click on the Add Assets option
b. click on the Wizard tab
c. select whether you are looking for higher return or lower volatility

Note: Calculations of returns and standard deviations used in the Wizard are only for the past three years. Therefore, the RORs and STDs may not be directly comparable to the RORs and STDs displayed for this portfolio depending on the time horizon used.

OPTIMIZING PORTFOLIOS

Optimization is the process of mathematically determining those portfolios that will achieve the highest possible rate of return for any level of risk (as measured by the standard deviation of returns) that an investor is willing to accept. Optimal portfolios are selected using the prospective assets/securities selected by the investor.

METHOD OF OPTIMIZATION

ICE employs a mean-variance optimization algorithm. This algorithm calculates optimal solutions using the asset and/or security rates of return, standard deviations, correlation coefficients, covariances, and any maximum or minimum constraints assigned at the asset type, asset class or security levels. An Efficient Frontier curve is displayed which includes up to 150 optimal portfolio mixes. **To view the performance of any Selected portfolio you must select a portfolio on the Frontier either by clicking on the Frontier or by moving up or down the Frontier.**

Optimal portfolios can be calculated using 1, 3 or 5 year RORs by clicking on the desired time period. Users can also calculate optimal portfolios on an after-tax basis (apply taxes), with management fees (apply fees), or after inflation (apply inflation).

When using strictly historical data, the optimizer may be unequivocally relied upon to provide the optimal portfolio in terms of return and "risk" for the specified time period. For example, using a time horizon of 1985 to the present, the optimal portfolio displayed would have been the "optimal" portfolio for that time period. Unfortunately, there is no statistical evidence to support the idea that returns will ever repeat themselves at any time in the future. Therefore, it is extremely important that the advisor carefully determine the underlying assumptions that are being used in the system.

If you believe that the next 12 -60 months will be somewhat inflationary, then you might want to use an historical time period that was, in fact, inflationary such as 1975-1980, or 1987-1990. Using this time horizon the program will calculate the correlations and standard deviations which actually may exist in this type of economic environment. Then forecasting rates of return for the next 12-60 months might give you a better scenario for the portfolio you are designing for your client. Again, there is no guarantee that future returns will actually be reflected by these forecasts or the displayed values for the portfolio.

OPTIMAL PORTFOLIOS

The ICE application employs optimization to find two "optimal solutions". **Optimal Portfolio - Risk**, and **Optimal Portfolio – Goal**.

Optimal Portfolio – Risk

When using the optimization function the application will first find the optimal portfolio that will achieve the highest possible rate of return without exceeding the Minimum ROR specified for the client. The Minimum ROR is set by the advisor by selecting an Investment Objective for the account (See Account Detail), by completing the 15 question Risk Profile Questionnaire, or by manually entering the Minimum ROR value. This value is the greatest amount of downside risk (real or nominal loss of principal) in any 12 month period that the client is willing to accept.

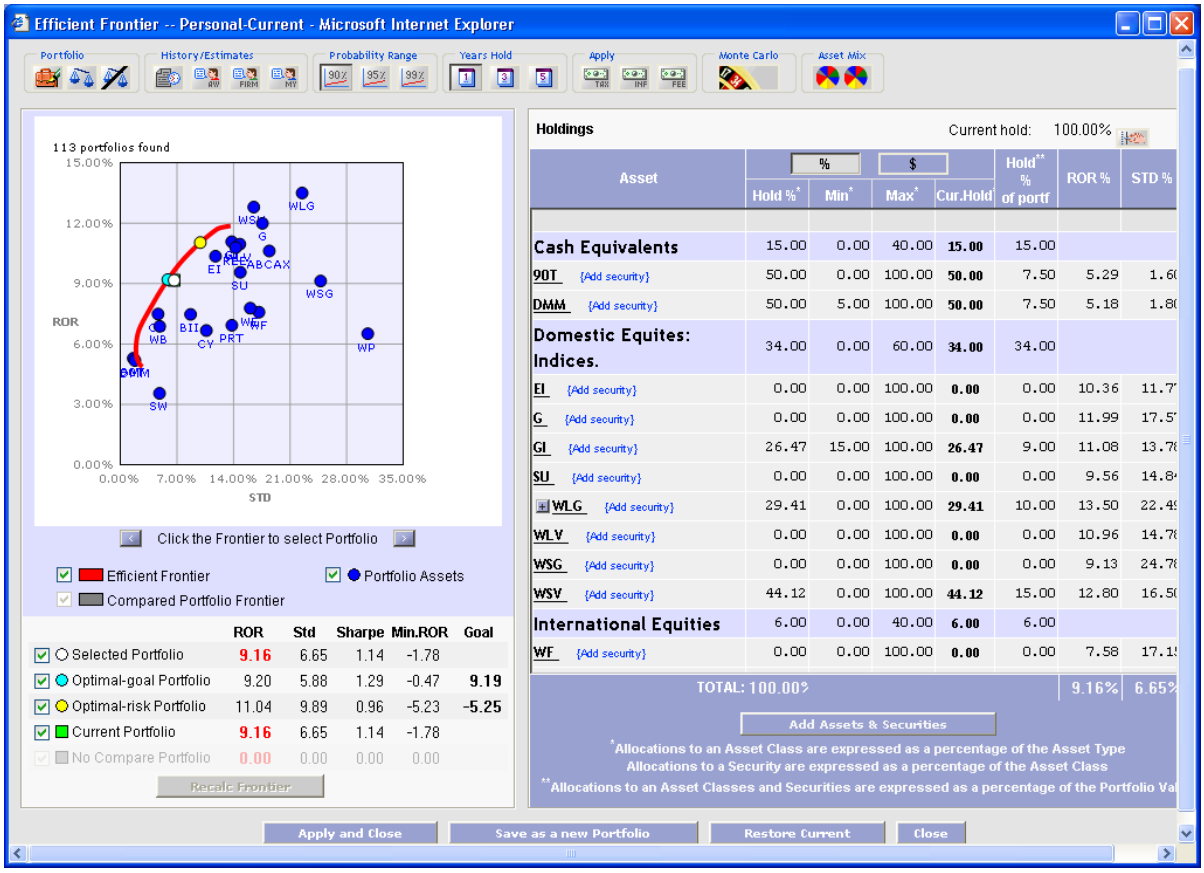
Optimal Portfolio - Goal

When using the optimization function the application will, in addition to finding the Optimal Portfolio-Risk, find the optimal portfolio that will achieve the client's financial goals. Using the Cash Flow & Financial Plan Analysis tools the advisor can set all of the client's financial goals such as college education, major purchases, retirement, leaving money to heirs and any other cash flow contributions and/or withdrawals for any time period. The Optimal Portfolio – Goal is the best portfolio alternative for achieving the client's financial goals with the least amount of risk (volatility).

The advisor and client can now review all possible optimal portfolios to determine which investment strategy is best suited to the client's financial needs and risk tolerance.

SCREEN DISPLAY

The screen displays the Efficient Frontier of all optimal portfolios; the Optimal Risk Portfolio; the Optimal Goal Portfolio; the current portfolio, the selected portfolio, all portfolio assets, a comparison portfolio (if any), the Efficient Frontier of another optimal portfolio mix (comparison); the % holdings of the current and selected portfolio; and many additional options. Graphic displays can be turned on or off at any time simply by checking or un-checking the respective items.


Efficient Frontier -- Personal-Current - Microsoft Internet Explorer
Portfolio
History/Estimates
Probability Range
Years Hold
Apply
Monte Carlo
Asset Mix
113 portfolios found
ROR
STD
Click the Frontier to select Portfolio
Efficient Frontier
Portfolio Assets
Compared Portfolio Frontier
ROR Std Sharpe Min.ROR Goal
Selected Portfolio 9.16 6.65 1.14 -1.78
Optimal-goal Portfolio 9.20 5.88 1.29 -0.47 9.19
Optimal-risk Portfolio 11.04 9.89 0.96 -5.23 -5.25
Current Portfolio 9.16 6.65 1.14 -1.78
No Compare Portfolio 0.00 0.00 0.00 0.00
Recalc Frontier
Holdings
Current hold: 100.00%
Asset
Hold %* Min* Max* Cur.Hold Hold** % of portf ROR % STD %
Cash Equivalents 15.00 0.00 40.00 15.00 15.00
90T 50.00 0.00 100.00 50.00 7.50 5.29
DMM 50.00 5.00 100.00 50.00 7.50 5.18
Domestic Equites: Indices. 34.00 0.00 60.00 34.00 34.00
EI 0.00 0.00 100.00 0.00 0.00 10.36
G 0.00 0.00 100.00 0.00 0.00 11.99
GI 26.47 15.00 100.00 26.47 9.00 11.08
SU 0.00 0.00 100.00 0.00 0.00 9.56
WLG 29.41 0.00 100.00 29.41 10.00 13.50
WLV 0.00 0.00 100.00 0.00 0.00 10.96
WSG 0.00 0.00 100.00 0.00 0.00 9.13
WSV 44.12 0.00 100.00 44.12 15.00 12.80
International Equities 6.00 0.00 40.00 6.00 6.00
WF 0.00 0.00 100.00 0.00 0.00 7.58
TOTAL: 100.00% 9.16% 6.65%
Add Assets & Securities
*Allocations to an Asset Class are expressed as a percentage of the Asset Type
Allocations to a Security are expressed as a percentage of the Asset Class
**Allocations to an Asset Classes and Securities are expressed as a percentage of the Portfolio Va
Apply and Close
Save as a new Portfolio
Restore Current
Close

SETTING CONSTRAINTS

The adviser may specify whether or not certain minimum or maximum constraints are to be applied to the allocation of capital. For example, some individuals cannot, or will not allocate more than 15 to 25% of their capital to real estate. If the client owns the property and building in which he does business, then that proportion of capital will remain a minimum allocation to real estate. Some clients wish to maintain certain minimum levels of capital in cash or cash equivalent accounts thereby requiring a minimum allocation to cash equivalent assets.

It is important not to arbitrarily constrain the portfolio unless absolutely necessary. Allow the optimization models to construct alternative portfolios first, then, if necessary, apply additional constraints on the optimization process. For example, if the optimal portfolio includes a 50% allocation to International Equities, and the adviser or the client do not believe such a concentration of capital in International Equities to be prudent at this time, the adviser may over-ride the model by constraining the optimization to a minimum percentage which is acceptable. As you would expect, in most cases where the optimal portfolio is re-constrained you will sacrifice some return and increase the portfolio standard deviation.

Users can set optimization constraints at the Asset Type, Asset Class and/or the Security level. ***After setting constraints or modifying any variable in the portfolio, the user must select "Re Calc Frontier" and then select a portfolio along the Frontier before any performance or allocation data will be displayed.***

a. Users can set the minimum and maximum amount that will be permitted for any or all Asset Type. The constraints are expressed as a percentage of the portfolio. For example, if a maximum of 5.00% is set for

Cash Equivalents, then regardless of how many Asset Classes or securities are assigned to that Asset Type, no more than 5.00% can be allocated to them as a group (Type).

b. Users can set the minimum and maximum amount that will be permitted for any or all Asset Classes. The constraints are expressed as a percentage of the Asset Type. For example:
    1. Maximum of 5.00% is set for Cash Equivalents
    2. Asset Classes selected:
        i. 90 Day T-Bills
            1. Constraint set at a maximum of 50% of the Asset Type
        ii. 30 Day Commercial Paper
            1. Constraint set at a maximum of 50% of the Asset Type
        iii. Donoghue Money Market
            1. Constraint set at a maximum of 50% of the Asset Type

    In this case, no more than 5.00% of the portfolio can be allocated to Cash Equivalents, and of that, no more than 50% can be allocated to any of the selected Asset Classes. The sum of maximum constraints at any level must be equal to at least 100% allocated to that level. If only one Asset Class is selected for an Asset Type, then you cannot set a maximum constraint of 50% since that would be less than 100% of the Asset Type.

c. Users can set the minimum and maximum amount that will be permitted for any or all Securities. The constraints are expressed as a percentage of the Asset Class. For example:
    1. Maximum of 5.00% is set for Cash Equivalents
    2. Asset Classes selected:
        i. 90 Day T-Bills
            1. Constraint set at a maximum of 50% of the Asset Type (Cash Equivalents)
                a. XYZ Fund Short-term Treasuries
                    i. Constraint set at a maximum of 100% (of 90 Day T-Bills)
        ii. 30 Day Commercial Paper
            1. Constraint set at a maximum of 50% of the Asset Type (Cash Equivalents)
                a. PDQ Short-term Bond Fund
                    i. Constraint set at a maximum of 100% (30 Day Commercial Paper)
        iii. Donoghue Money Market
            1. Constraint set at a maximum of 50% of the Asset Type (Cash Equivalents)
                a. LKL Money Market Fund
                    i. Constraint set at a maximum of 100% (Donoghue Money Market)

    In this case, no more than 5.00% of the portfolio can be allocated to Cash Equivalents; of that, no more than 50% can be allocated to any of the selected Asset Classes, and no more than 100% of any Asset Class can be allocated to the selected securities. The sum of maximum constraints at any level must be equal to at least 100% allocated to that level. If only one security is selected for an Asset Class, then you cannot set a maximum constraint of 50% since that would be less than 100% of the Asset Class.

SETTING GLOBAL CONSTRAINTS

Users can set constraints globally by clicking on the Portfolio icon and entering their choices.

MODIFYING HOLDINGS, RORS & STDS

Users can modify any ROR or STD simply by highlighting the desired field and entering a new value (if permitted by your firm). *After setting constraints or modifying any variable in the portfolio, the user must select "Re Calc Frontier" and then select a portfolio along the Frontier before any performance or allocation data will be displayed.*

COMPARING PORTFOLIOS

Select a portfolio to compare against the "Selected" portfolio by clicking on the Select option for Portfolio Comparison. Find the desired portfolio and click on Select. The comparison portfolio will be displayed in the Efficient Frontier graphic as a solid gray box.

The comparison may be turned off at any time simply be clicking on the check box. This graphic displays a comparison of an "optimal" portfolio and another (the client's existing) portfolio in the same risk/return space. The "optimal" portfolio will be indicated along the Frontier curve, while the client's existing portfolio is displayed as a green square elsewhere on the graph.

It is important to note that both portfolios have precisely the same probability of achieving the displayed returns and volatility. Therefore, all things being equal, there is no reason for selecting a portfolio other than the more efficient proposed portfolio.

COMPARISON EFFICIENT FRONTIER

When a comparison portfolio is selected, the graphic will also display the Efficient Frontier for the comparison portfolio. This is particularly valuable when comparing two different sets of asset class selections. For example, if one Frontier is displayed to the left (less volatility) and above another Frontier (higher returns), it would indicate that the former is a preferable mix of selected assets and that the corresponding "optimal" portfolio would also be preferable.

DISPLAY OF ASSET CLASSES

The Efficient Frontier graphic also displays all Asset Classes available in the portfolio. In general, the ideal portfolio will have a volatility (STD) less than any of the assets in the portfolio. Of course, the more risk an investor is willing to take, the greater the portfolio volatility will be relative to selected assets.

APPLY & CLOSE

Applies the displayed holdings to the current portfolio and closes the screen. **CAUTION: This operation will overwrite the portfolio you are currently working on, so be sure that this is what you want to do.**

SAVE PORTFOLIO AS

You may save the desired portfolio as a new portfolio. Select the client and account for which you will associate this portfolio (no selection is necessary if it is for the same client and account currently in use), and enter the new portfolio name. If this is a new type or portfolio (proposed, testing), or if this portfolio will have characteristics that are different from the portfolio you have been working with, you will need to open the details for this portfolio and make the necessary changes.

MODERN PORTFOLIO THEORY - MPT

Modern Portfolio Theory (MPT or asset allocation), is a method of assisting those concerned with investment analysis, portfolio design, and performance evaluation in expressing quantitatively their views regarding risk and its relationship to investment return. They focus attention on the overall composition of the portfolio rather than the traditional method of analyzing and evaluating the individual components. The investment manager is therefore able to examine and design portfolios predicated on explicit risk-reward parameters and on the identification and quantification of portfolio objectives.

Financial professionals need more practical methods of solving very sophisticated investment and retirement objectives. MPT techniques and related software programs help provide solutions (i) to better risk management, (ii) the design of investment portfolios, and (iii) the selection of appropriate investment vehicles and managers.

Simply stated, asset allocation or MPT is the process of selecting a mix of asset classes and the efficient allocation of capital to those assets by matching rates of return to a specified and quantifiable tolerance for risk. Risk tolerance is essentially the percentage of an investment portfolio that an investor is willing to risk to achieve a specific rate of return.

The foundation of MPT rests upon four basic premises.

(1) Risk Aversion

Investors are inherently risk-averse. Investors are not willing to accept risk except where the level of returns generated will fairly compensate for that risk. It's reasonable to assume that investors are more concerned with risk than they are with rewards. The problem historically has been to quantify risk and its relation any "reasonable" return.

(2) Efficient Markets

Most academic and industry research supports the concept that markets, at least in the broadest sense, are reasonably efficient. As asset classes, growth equities, intermediate bonds, real estate, commodities, etc. are generically efficient. The nature of an efficient market is such that all participants have the same information regarding the markets in general, and specific issues in particular, at the same time, although they may come to opposite conclusions as to an appropriate price for individual securities. It is, perhaps, ironic that the sophistication of money managers and their virtually instantaneous access to information creates greater efficiency in the marketplace, thereby making above-average returns extremely difficult to achieve. With the advance in information technology and more sophisticated investors the markets are likely to become even more efficient.

(3) The Portfolio As The Determining Factor

The third premise is that the focus of attention should be shifted away from individual securities analysis to consideration of portfolios as a whole predicated on explicit risk-reward parameters and on the identification and quantification of portfolio objectives. Today it is more likely that the efficient allocation of capital to specific asset classes will be far more important than selecting the "right" components of any asset class.

(4) Portfolios Can Be Quantitatively Optimized

The fourth premise for Modern Portfolio Theory is the optimality of portfolio returns vis-à-vis portfolio risk. In other words, for any level of risk that one is willing to accept, there is a rate of return that should be achieved. Quantitative methods are used for measuring risk and diversification, making it possible to create efficient and theoretically optimal portfolios. Portfolio diversification is not so much a function of how many issues are involved, as it is of the relationships of each asset to each other asset and the proportionality of those assets in the portfolio. Investors should search for those assets which tend to have negative relationships to each other. The portfolio should include assets which go up in value as the value of other assets declines.

The extent to which knowledge of one asset return provides information regarding the behavior of another asset is measured by the correlation of returns. Are they moving in the same or opposite directions at the same time?

Measurements of risk and return characteristics of individual investments are inadequate in explaining what happens when investments are combined in portfolios. The true measurement of diversification between assets is called the covariance of the assets. Covariance measures the timing, direction and momentum of the movement of two variables. Are they moving in the same direction at the same time, and what is the volatility of the movement of

each variable. By calculating the covariances and expected returns for all of the assets in any given portfolio it is possible to calculate the optimal portfolio mix for any degree of risk. Each portfolio on this "efficient frontier" will generate the highest possible rate of return for any specific level of risk, with risk being measured by the standard deviation of returns. Any other portfolio which exhibits the same standard deviation (risk) will generate lower returns and will therefore be considered inefficient.

Another way of saying this is the investor must increase the expected return by the maximum amount for each additional unit of risk he is willing to take. The increase in return vis-à-vis any increase in risk is measured by a function called the Sharpe Ratio.

The number of assets in the portfolio is less important than the relationship of those assets. For example, if a portfolio consisted of only two assets with a perfectly negative correlation and differing volatilities (standard deviations), there is some mix of those two assets which will provide 0% portfolio risk and a predictable rate of return. Therefore having many assets in a portfolio will not reduce the systematic risk in the portfolio as much as having negatively correlated assets.

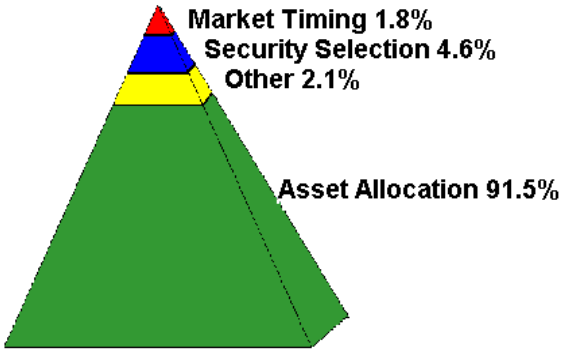
It is a misconception, albeit a widely held one, that investors must accept higher levels of risk to achieve higher returns. By using asset allocation methodologies, investors may achieve higher returns with less risk.

Implementing MPT through the process of asset allocation may include one or all of the following approaches:

WHAT DETERMINES PORTFOLIO PERFORMANCE?

The importance of asset allocation was demonstrated by a study of 91 large pension plans. The study sought to attribute the variation of total returns among the plans to three factors:

- Asset allocation policy
- Market timing
- Security selection



Source: Brinson, Beebower & Singer
Determinants of Portfolio Performance II: An Update, 1994

The chart above dramatically demonstrates the study's conclusion that asset allocation is the primary determinant of investment performance.

Strategic Asset Allocation - uses historical data (mean rates of return, standard deviations and covariances) in an attempt to understand how the asset has performed and is likely to perform over long periods of time. The goal is not to "beat" the market, but to establish a long-term investment strategy using a core mix of assets.

Tactical Asset Allocation - uses periodic assumptions regarding the performance and characteristics of the assets and/or the economy. This approach attempts to improve portfolio performance by making "mid-course" changes in the long-term strategy based on near-term expectations.

Dynamic Asset Allocation - involves changes in investor circumstances, which may lead to the modification of policies, objectives and/or risk tolerances. Resulting changes are intended to maintain equilibrium between the investor's policies and objectives and the asset allocation process. There is very little, if any, relevance to historical information regarding investment performance before 1960. The economic environment and investment alternatives today are substantially different from those of the past. We can no longer be myopic in our view of investments in so far as we restrict our analysis to domestic issues of equities, bonds, real estate, commodities or other investment vehicles. The traditionally domestic portfolio is clearly inadequate in today's internationally based economic and investment environment. Further, the complexity and volatility of today's

investment world requires access to, and proficiency with superior analytical tools and databases. Many professionals now realize that developing successful investment strategies and competing for investment capital depends on their ability to employ the most sophisticated analytical techniques.

THE ASSET ALLOCATION PROCESS

Development of Policies and Objectives
The first step in the asset allocation process is the development of a set of policies and objectives which will govern the design and management of a client's portfolio. This step includes an accurate assessment of the client's risk/return attitude and the asset classes appropriate for the client. As these factors change, a new analysis is required. Thus, asset allocation is a continuing process.

There are several factors which can influence the asset allocation process. These factors may be evaluated using the systems' Questionnaire or a similar type of information gathering method.

- **The investor's risk tolerance**

Since the correct method of evaluating client risk as a quantitative measure of portfolio risk (loss of principal), it is important for the adviser and the client to understand the amount of principal loss the client is willing to tolerate in any one year of the investment period. For example, younger clients may be willing to accept downside risks of -10% while one who is retired or about to retire may not be willing to lose any principal. Risk parameters such as "moderate", "aggressive", "some" or "a little" are unacceptable. Be specific!

For pension accounts it may be more a function of existing actuarial and funding requirements than risk of loss in any one year. Therefore the adviser should view risk as a function of meeting certain minimum compound annual return requirements. Set the Maximum ROR period for 3-5 years and the Minimum ROR for the minimum compound rate of return required by the client (ie: 5 years and 8.5%)

- **The rate of return objective**

The return objective may be determined as a function of the client's future requirement for income, or as required by actuarial assumptions. Once established, the programs will determine how much portfolio risk will be required to achieve the expected rate of return. This is extremely important since clients may not be willing to accept levels of risk required to achieve desired returns. Consequently, future income or funding requirements may have to be modified in accordance with the client's risk tolerance.

- **The investment period**

Typically the investment period will be five years. It is important that clients view the investment process as a long-term plan for achieving desired investment results. An investment period of any length, whether it be one year or five years, if viewed in an absolute sense will inevitably result in disappointment.

However, from a more academic view point **one year** would be the more appropriate period since portfolios will be re- optimized and/or re-evaluated on a quarterly or semi-annual basis. Since the portfolio will be modified several times within a five-year period, the original expected five-year returns are not likely to be realistic objectives. Further, the risk a client is willing to take in any one year is more accurately tied to his expectation of returns in the one year period.

- **Asset constraints** (minimum or maximum percent allocated to each asset)

Any constraint on the minimum or maximum amount of capital to be allocated to specific assets must be determined prior to initial portfolio analysis and optimization. These constraints will include illiquid investments, ownership of business property, maximum amounts of capital allocated to international or aggressive investments, maximum allocations to real estate, minimum allocations to cash or debt instruments for current income, etc.

- **Asset characteristics such as variability and mean rates of return**

Clients with low risk tolerances will not need, or want asset classes which exhibit high standard deviations (risk). Therefore, assets with high risk characteristics should be excluded from consideration. These might include international equities, aggressive growth equities and long- term bonds. More conservative investors will prefer growth & income equities, balanced (equity & bond funds), GICs, real estate, and short-term debt instruments.

- **The comparative relationships of assets in the mix (correlations and covariances)**

The relationships of asset classes and pooled funds is important in determining the level of diversification in the portfolio. Assets which exhibit high positive correlations will tend to move in the same direction at the same time.

Therefore it is necessary for the adviser to include assets which tend to have very low or negative correlations (and covariances). For example, owning 100 stocks will not reduce the systematic (inherent) portfolio risk any

more than owning 20 stocks across industry lines. Therefore it is less a question of how many assets or issues are in the portfolio than of how the assets move in relation to each other. If all of the assets exhibit high positive covariances or correlations, the adviser should, and perhaps must, consider including alternative assets with low or negative correlations to other assets in the portfolio.

User have the ability to select any period of time for which asset and portfolio calculations are made to determine returns, correlations, covariances, and standard deviations. This may be extremely important if you wish to consider these relationships during periods of inflation or deflation. The period 8/76 to 9/81 would be an appropriate period for inflation and low growth; and the period 9/81 to 10/87 would be appropriate for disinflation and growth. If you are unsure of either scenario, or assign a probability of 50/50 to both, then you may **use the period 12/85 to the present**. The following table will demonstrate the importance of selecting the appropriate period for calculations.

CORRELATION MATRIX
For
Aggressive Growth Funds Index

	1/78 - 2/82 (inflation)	12/80 - 1/87 (deflation)
90 T-Bills	0.4840	-0.3757
Intermediate Corp. Bonds	-0.0720	0.6598
Long-term Gov. Bonds	-0.4558	0.5678
Real Estate (Diversified)	-0.3529	-0.7804

o The probability range required for portfolio optimization

The adviser and client must select a level of statistical probability within which they will review the expected performance and risk of the current and optimized portfolio. These levels of statistical probability may be set at 80%, 90%, 95%, and 99%. The default level is at 90%.

o The minimum difference between the allocation of one asset over another

This policy will determine when capital is shifted between assets. For example, if the policy requires a shift of no less than 5%, then a recommended shift of 3% will not be made whereas a shift of 8% will.

Client Risk - Minimum Period Return

The minimum period return will generally be a value of from 0% to any negative value (as a loss of principal). If, however you have specified a five-year holding period for Maximum horizon and are concerned with minimum annual compound returns, then this value may be anything from 0% to any positive value such as 10%. To express the client's tolerance for risk of loss you will generally enter **1** for the number of years followed by the percent of portfolio principal which the client may be willing to lose in any one year. If the client is not willing to lose anything, leave the Rate at 0.0%. If the client is willing to lose 2% of his principal in any one year, enter **-2.0**.

If the client (a defined benefit plan for example) needs a minimum rate of return over five years, enter **5** for the number of years and the rate required for that period. In optimizing the portfolio the programs will tell you:

1. is that rate of return achievable

2. if it is achievable, how much risk is the client taking in any one year to achieve it. If the five year rate is achievable but the risk is to high, you may re-optimize the portfolio by establishing a specific risk level which is acceptable to determine the highest rate of return which may be expected within the client's risk tolerance. It may be that the client will have to modify the rate of return expectation or increase the tolerance for risk, or both.

Probability Range Of Returns

The Probability Range is a function of the probability of achieving a range of expected returns. At the 90% level, approximately 90% of all possible returns will fall within the range displayed. In most cases the 90% level will be sufficient for evaluation. The Minimum return is the value referred to as the "risk" the client may be willing to accept as a potential loss measured as a percentage of principal. For example, if at the 90% level the mean ROR is 6.5%, the maximum is 14.5% and the minimum return is -2.50%, then there is a 90% chance that the portfolio will not lose more than 2.5% or make more than 14.5%. However, there is still a 5.0% chance that the

portfolio could do worse than being down -2.5% and a 5.0% chance that the portfolio could do better than +14.5%

high 14.5%
mean 6.5%
low - 2.5%
STD = 8.0%

Minimum & Maximum Constraints
Percentage constraints may be entered, however, you should not enter any minimum or maximum asset constraints unless absolutely necessary. You may always return to this screen to establish constraints if the optimal portfolio suggests greater or lesser percentages than you believe warranted.

Yield
Yields will be loaded by program where yields are available in the databases, otherwise users must enter them separately. If they are not entered, then Income Taxes will not apply to that asset - only the Capital Gains rate will apply.

Contributions & Withdrawals
Contributions and Withdrawals are the amounts which the client wishes to add to or withdraw from his account on a monthly, quarterly, semi-annual or annual basis. Withdrawals may be made on a percentage of portfolio basis if desired. You may set the amount, whether the amounts will be inflated, beginning and ending times, and number of times the contribution or withdrawal will occur. A complete Cash Flow statement may be reviewed using the Tables option.

Applying Tax Rates, Management Fees and Inflation Rates
Tax Rates, Management Fees and Inflation Rates may be applied automatically (check them in the Portfolio Info screen) or on the fly (clicking on the icons).
You may select any or all of these factors. The portfolio performance will be changed as follows depending on which, if any, of the factors you wish to use in calculating performance.

Tax Rates
The Tax Rates (Income Tax and Capital Gains Tax) will tell the programs to generate after-tax returns in the Optimization programs and in portfolio simulations. Management fees are those fees charged by the adviser, if any, and will also effect the Optimizer and the portfolio simulations. Both entries may be set globally or individually within the portfolio. However, these values may be modified and set at different rates for each asset if desired. Simply move the cursor to the desired asset and then to the appropriate field you wish to change.

Yield
The program calculates the after-tax yield on each asset based on the Income Tax specified in the Questionnaire. Capital Gains: Capital Gains is the net difference between any Yield specified and the assets' total return. The program calculates the after-tax capital gain on each asset based on the Capital Gains tax specified in the Questionnaire.

These rates are initially set globally. However, different rates may be assigned to different assets, or some assets may be made non-taxable while others remain taxable investments. For example, if Municipal bonds are included in a non-qualified portfolio, you may wish to specify that this asset is non-taxable (applicable only to income).

Management Fees
The Management Fee is pro-rated to the Yield and the Capital Gain for each asset in the portfolio. Management Fees as specified in the Questionnaire are defaulted to for all assets in the portfolio. However, different Fees may be assigned individually to each asset in the portfolio. Since, in most cases, Management Fees are not tax-deductible from portfolio returns, they are deducted from income and capital gains after taxes are applied.

As an example, you may wish to set the management fee for money market investments to be zero while other assets will generate a fee of 1.0%.

Inflation Rate
You may set any inflation rate you desire in the client profile. Values in the Optimizer and in portfolio simulations will reflect returns and dollar values after allowing for the effects of the specified inflation rate (real rate of return).

Inflation is pro-rated to the Yield and Capital Gain for each asset in the portfolio. Since inflation erodes the value of all earnings and portfolio values, there is no function to specify inflation rates separately for each asset.

Transaction Fees
Transaction Fees are only deducted from individual asset capital gains prior to taxes.

Transaction fees reduce the tax-basis of a portfolio and as such are not directly deducted from income generated on the portfolio assets. Further, Transaction Fees are treated as a one-time charge against the portfolio value in the beginning of the first year only.

Transaction Fees are the estimated costs of making any transaction within the portfolio (a shift from one asset to another). These may be over-ridden by re-setting them individually for each asset/fund in the portfolio. The Transaction Fee is expressed as a percent of an amount actually being added to the portfolio. For example, if growth funds currently constitute 10% of the portfolio and they will constitute 20% after optimization, then assuming a transaction fee of 4% is charged on the purchase of new shares, the transaction fee percent to be entered will be 2% (4% of 10% = 2% of 20%).

The effect of these policies (tax rates, withdrawals, contributions, management fees and transaction fees) may be viewed in the "Expected Portfolio RORs", "Expected Portfolio Values" "Portfolio ROR Summary", and "Portfolio Values Summary" sections. By modifying these policies the user may review the consequential effects on the portfolio of such modifications.

ECONOMIC ESTIMATES - ADVISORYWORLD:
These are estimated total rates of return for the next twelve months, and may not be edited. However, they may be incorporated into the expected returns for portfolio asset classes in evaluating existing client portfolios, constructing efficient frontiers, and in simulating portfolio performance (see Portfolio Profiles/Optimization).

These economic estimates are reviewed and modified periodically, and are updated along with regular monthly updates. Consensus figures are provided by Blue Chip Economic Indicators. All other estimates are provided by AdvisoryWorld.

Computation Of Total Return Estimates For Asset Classes:
- historical mean ROR of 90 Day T-Bills from 12/86 to 12/2001
- historical mean ROR of each asset from 12/86 to 12/2001
- change in current yield for 90 Day T-Bills from consensus forecast by approximately 50 economists for T-Bill rate in next 12 months
- current yield on each fixed investment and forecasted yield
- relative change in each asset versus estimate change in 90 Day T-Bills (Beta)
- relative change in each asset independent of change in 90 Day T-Bills (Alpha)

Total return estimates are derived by computing the historical relationships between the yield on 90 day Treasuries and each index based on rolling one year mean rates of return for the period 12/1986 to 12/2001. These relationships are correlated to current rates and the expected 12 month rate on 90 day T- Bills, plus or minus an amount which may be expected based on the relationship between the change in rates for 90 day T-Bills and each index plus or minus an amount which might be expected based on the performance of each index independent of the change in 90 Day T-Bill rates. For example, an increase in the expected yield on 90 day T-Bills will (for some indices) increase the expected yield and decrease the expected equity value, thereby reducing the expected total return in relation to T-Bills. The High and Low estimates are within one standard deviation of the historical mean returns.

It should be emphasized that these estimates are based on **historical** relationships and a broad **consensus** opinion as to the future rate of return for 90 day Treasury Bills. While these estimates may represent an average annual return based on historical relationships, they may not reflect AdvisoryWorld' opinion as to the most likely rates of return over the next twelve months for each asset class.

DESIGNING REALISTIC AND THEORETICALLY OPTIMAL PORTFOLIOS

What should investors achieve with an investment portfolio?

In general, the primary objective for any investment portfolio is to provide sufficient capital and income for the investor to live “comfortably” in post retirement years. For larger estates, the objective may be substantially different, but in all cases you must be able to evaluate alternative scenarios and their likely outcomes.

Are the current investments the right ones for your client?
In almost all cases, investors acquire assets based on the investor’s perception of how each asset will perform in the future. No attention has been paid to the risk characteristics of the individual investments; how each investment will perform relative to each other investment, or how a portfolio containing all of the investor’s assets might perform. It is imperative that the advisor choose those assets that, when combined, will meet the investor’s growth and risk requirements. For example, investors that are more risk conscious should not have equities and long-term bonds in their portfolio since they tend to have a positive correlation to each other, thereby compounding the volatility of the portfolio.

How can you determine appropriate investments?
The advisor and the client should consider all assets that are acceptable to the investor. Based on the client’s risk tolerance and economic situation, the advisor should recommend those assets that, based on historical or forecasted performance, will provide the highest possible rate of return without exceeding the client’s tolerance for potential loss. Selected assets should have negative or very low correlations to each other and, ideally, high covariances (covariance measures the timing, direction and momentum of the movement of two independent variables). The advisor should **never**:

a) recommend assets that all have a positive correlation to each other
b) recommend assets that provide greater volatility than the client is willing to accept
c) recommend a superfluous asset. If two assets are positively correlated , and one has a lower historical or estimated rate of return and a higher standard deviation (volatility), the latter investment should be excluded from consideration.

Having said this, there may be times when you, as the advisor, have certain knowledge or expectations that warrant the inclusion or exclusion of some assets. The classic example would be Japanese or Pacific Rim securities in 1988 when most advisors were under-weighting Pacific Rim securities in portfolios as they were considered substantially over-valued.

How much diversification will be required?
It is important to note that diversification is not a function of how many assets are included, but rather are they negatively correlated and do the selected assets balance the portfolio. For example, if you had an equity portfolio of 100 stocks the portfolio is nor more diversified and the systematic risk of the portfolio is not reduced any more than if you had only 20 stocks across industry lines. In other words, adding 80 more stocks to the portfolio did not reduce the risk of the portfolio. In fact, having just two perfectly negatively correlated assets in the portfolio would represent a portfolio which will exhibit zero risk and a constant and predictable rate of return (it should be noted that we have never seen two perfectly negatively correlated assets). The point is, portfolios which contain only three or four assets may, in fact, be far more diversified than portfolios that contain 9 or 10 assets.

In some cases you may find that although you have included several assets, the Optimization routine only recommends three assets. Mathematically the relationships of the assets (returns, correlations and covariances) will support the recommendation. However, you may feel that additional "diversification" is necessary. Remember, your knowledge, experience and understanding of your client’s needs are as important as any mathematical algorithm in the asset allocation programs. It is also true that these programs and the algorithms employed are not magical and therefore should only be relied upon as "mathematically" probable. There is not any means by which the programs can know about current or possible economic events which might further influence the performance of any asset or assets. Your experience, expertise and knowledge will be useful in guiding the composition of the portfolio.

How much risk is your client taking with his present mix of assets?
It is virtually impossible to develop meaningful portfolios for your client unless you have knowledge of how the existing portfolio might be expected to perform. From a marketing stand point, there are very few investors who would not pay to know how much risk they are currently taking with their portfolio and what kind of

performance might be expected. Managing the investor’s risk and expected performance are critical in providing sound financial advice.

How much risk can your client comfortably accept with any investment portfolio?

A review of the current portfolio's risk characteristics with the client should give you and the investor a good idea of how much risk he is willing to take. Do not be generic in specifying this risk (ie: growth & income or aggressive). Risk is a function of how much loss of principal (real or nominal) the client is willing to accept in any 12 month period. Assuming a balanced portfolio, risk levels should never exceed -8.0% (minimum ROR) in any 12 month period.

How can you manage the portfolio risk?
The risk (volatility) of a portfolio is directly related to the correlation characteristics of the assets and the portfolio. The lower the asset standard deviations and the greater the degree of negative correlation, the lower the portfolio risk will be. Using the optimization routines in these programs you will be able to find portfolios that will meet your client's risk tolerance while providing an acceptable and achievable rate of return.

It is important that investors get the most they possibly can from their investments. The following worksheet may help in establishing policies, objectives, risk parameters and investment alternatives which will achieve your financial goals and answer some of your investment questions.

- What financial goals does the investor want to achieve?
- When does he hope to reach them?
- How much risk is he willing to take to achieve those goals?
- How much money can he invest now and in the future?
- How much money will he need to achieve his goals?

It takes some time and thought to review your client's finances and financial goals, but the time and effort are well worth the results.

Most investors acquire assets without much, if any, consideration given to their financial objectives, expected portfolio rates of return, risk, and the inter-relationship or balance of the assets involved. They generally end up with a mix of unrelated investments which, as a whole, can never fulfill the investor's policies and objectives. Investors need to design portfolios which will achieve their financial objectives by matching assets according to risk/return trade-offs. If capital is allocated efficiently to a series of well balanced assets, portfolio returns will generally be higher over the long-term, and portfolio volatility will be lower. Establishing well thought out policies and objectives and using AdvisoryWorld asset allocation programs will result in portfolios with greater predictability of and stability of returns and theoretically optimal performance. By answering the following questions you should be in a better position to achieve your financial objectives.

1. Are the client's investment objectives clearly defined (retirement/current income, college expenses, building wealth)?

2. What rate of return is required over the short, intermediate and long-term?
   Short_____% Intermediate_____% Long_____%
   (is the current portfolio able to meet those expectations?)

3. What rate of return is the current portfolio expected to generate over those periods?
   Short_____% Intermediate_____% Long_____%

4. What asset classes currently constitute the portfolio?

4a. Why were those assets chosen?
   It is a good idea to get a clear understanding from the client why each investment was chosen and what expectations he has from each one.

4b. Have other assets been considered? Which ones? Would other assets be considered?

The time period and expected rate of return are critical in determining which investments should be used to achieve investor's goals. The strategy for achieving short-term goals is very different from the strategy for reaching long-term goals. Short-term goals require high liquidity and low risk. For long-term investments you will be less concerned with short-term volatility and more concerned with higher returns and capital appreciation. Long-term investment returns should, at the very least, exceed the inflation rate thereby providing you with the same purchasing power in five years that exists today.

The selection of investments should match the investor's financial objectives. Investments which are illiquid and seek capital appreciation are not suitable for achieving short-term goals. Finally, and perhaps most important, investments should be chosen based on their correlation to each other asset in the portfolio. Negatively correlated investments will provide the best balance and most optimal portfolio returns and volatility. The following may help in the selection or consideration of alternative investments.

Time Horizon	Characteristics to Look For	Risk/Return Trade-offs	Alternative Investments
Short-Term	Minimal or no change in price	Lower total returns Vulnerable to inflation	Money Markets Treasury bills
(0-2 years)	Moderate yields Regular income payments High liquidity, no withdrawal penalties or fees Slightly more volatility	More volatility - risk Lower returns than Int. bonds	Short-term CDs Short-term bonds
(2-5 years)	Fixed term and/or regular payments Some liquidity Some capital appreciation	More volatility - risk Limited capital appreciation potential	Equity income securities Utilities High income, limited appreciation securities Int. term fixed securities Int. term annuities
(5+ years)	Highest total return Greater volatility Capital appreciation Total returns that exceed inflation rate	Greater risk than intermediate or short-term securities Limited liquidity	Long-term bonds Equities with high growth potential International equities Real estate Commodities Collectibles

In most cases, investors make investment decisions based on the expected performance of a specific issue (such as an individual stock, bond, or property). According to industry and academic studies, approximately 91.5% of the performance and risk in any investment portfolio is related to the asset classes and only 5- 7 % is related to the specific issues involved, market timing or the selection of specific securities. Therefore, in allocating capital to specific issues one must consider the asset class involved and their relationship to all other asset classes in the portfolio. In fact, under the new ERISA regulations, you will be required to have a working knowledge of Modern Portfolio Theory and to be able to construct portfolios in accordance with these methodologies. Without a diligent analysis of the client's needs and risk and the use of sophisticated asset allocation tools, it will be almost impossible to meet these new regulations.

5. Are there any asset constraints (minimum/maximum amount allocated to specific assets)?
If your client currently holds investments in long-term, illiquid assets, the portfolio will be constrained by the capital committed to that asset. The advisor should not arbitrarily constrain the portfolio assets (assign minimums and maximums) before optimizing the portfolio. It is strongly recommended that the advisor optimize the portfolio and then iteratively set minimum or maximum levels for each asset (or you may set global minimums or maximums of some amount) until the portfolio meets your satisfaction.

If you believe that the optimization algorithm has allocated too much or too little to a particular asset, you should review the returns before setting constraints. It may well be that the asset in question has a rate of return far higher than you are comfortable with. Consequently, you should lower the return estimate and then re-optimize. You should find that the allocation is materially different using the new ROR estimate.

A good example of the foregoing would have been the Pacific Rim index in 1988. At that point the index return for the past 10 years was around 21%, far higher than most advisors were willing to forecast for the next 12 - 24 months. By lowering the forecasted return to the 10% level the allocation to Pacific Rim securities dropped from 80%+ to around 12%. This allocation was predicated on the asset's forecasted ROR, historical STD and its relationship to each other asset in the portfolio, and not some arbitrary figure that would have been incorrect in relationship to the other assets and the portfolio as a whole.
The reason for not pre-setting constraints is that there is no way the advisor can know precisely the mathematical relationship of each asset to each other asset in the portfolio. Consequently, pre-setting constraints may have the adverse effect of tilting the portfolio in the wrong direction.

6. What percentage of capital is presently allocated to each asset class?
   a. How were those percentages determined?
   b. What guidelines are used to determine when and how much capital is to be shifted from one asset class to another?

Diversification is not a very well understood concept. Most investors think equity portfolios are diversified if they have 100 different stocks. Actually, owning 100 different stocks does not reduce the systematic risk of a portfolio any more than owning 20 different securities across industry lines. True diversification can be achieved if you own two or more assets which have a negative, or nearly negative, relationship to each other. Basically this means that when the value of one asset is declining, the value of the other(s) is rising.

7. Are the asset classes diversified by correlation, as well as by type, duration, liquidity and return?
If the value of one asset class were to decline, does the investor own other assets which will tend to rise in value at the same time? In order to determine the performance of a portfolio you should establish mutually acceptable benchmarks against which the performance of each asset class in your portfolio can be measured. If the assets (investment managers) are not meeting these standards for performance, you should consider alternative investments (managers). Performance evaluation should be done in a timely and consistent manner such as quarterly or semi-annually.

8. How has the portfolio performed relative to similarly constituted portfolios, or surrogate assets?
   Excellent_____, Good_____, Fair_____, Poor_____

The basic need of any investor is to conserve capital, or at least achieve reasonable rates of return without risking unacceptable amounts of capital. Defining risk tolerance is perhaps the most important decision you will make in constructing a portfolio. This should not be done in ambiguous terms such as "conservative", "moderate", or "aggressive". The use of such terms makes it virtually impossible to evaluate the risk-return characteristics of a portfolio in any meaningful way. Establish a percentage of the portfolio which the investor can <u>reasonably</u> lose in any one year of an investment program. By knowing the level of acceptable risk in absolute terms, you may construct portfolios which should not exceed the client's downside risk parameters.

9. What level of risk (percent of portfolio loss in any one year) is acceptable? _____%

10. Does the current portfolio exhibit risk characteristics that are acceptable?

11. Is the current portfolio constructed to maximize returns relative to your client's risk tolerance?

In reviewing alternative investments it will be useful to determine the one year mean rates of return for those investments and the maximum potential loss of each in any one year at the 90% confidence level. Notice how the potential loss for most equities is less than for long-term government bonds, and the expected rate of return is higher. This exercise may be helpful in determining which assets are used and the risk associated with each asset. The actual portfolio risk, however, is a function of the relationship of the assets to each other as well as their volatility (covariance).

Each of the portfolios on the **Efficient Frontier** will provide the highest possible return for any level of portfolio volatility (STD). Mathematically, there are no other combinations of the portfolio assets which can generate higher returns for the same level of volatility. If asset constraints, returns, standard deviations, tax rates or other characteristics of the portfolio are modified, the algorithm will take those changes into consideration when calculating the optimal portfolios. When comparing optimal portfolios to existing or alternative portfolios it is important to understand that all of the portfolios have precisely the same probability of achieving the displayed risk/return characteristics given the assumptions implicit in the program.

Investing is an on-going process which will not end when this process is completed. Investment performance, client needs, and objectives will change constantly. Investor's financial objectives, attitude towards risk, and the performance of his portfolio at least twice a year, and perhaps quarterly. There is no substitute for thoughtful consideration and diligent supervision where your client's money is concerned.

Investors are not, and indeed should not be looking for simplistic or pat answers to investment needs or single factor solutions to multi-factor problems. They are risk-averse and don't want to "shoot from the hip" or "guess". They do not want short-term solutions to their long-term problems. Solving for client's needs requires the expertise

and the tools to develop long-term investment strategies and to implement those plans, manage the portfolio and evaluate portfolio performance relative to established policies and objectives.

TERMS, DEFINITIONS

ASSET CLASS

There are essentially seven asset classes and a series of sub-classes included in the CAMS portfolio modeling system. The primary asset classes include cash, equities, bonds, real estate, guaranteed investment contracts, commodities, and venture capital. The sub-classes would include such items as domestic or international equities; short, intermediate, or long-term corporate and government bonds; and gold, silver and oil.

ASSET CONSTRAINTS (min./max.)

The optimization mode of the CAMS programs allows for the proportional allocation of specific assets to the portfolio from 0% to 100%. These constraints determine the extent to which any asset will be included in the optimized portfolio. Proportional allocation should only be performed prior to the portfolio optimization program when a fixed proportion of a portfolio must be allocated to an asset, or where minimum/maximum percentages are specifically desired.

CORRELATION

Correlations represent the strength of the relationship between two variables. The correlation coefficient measures the timing and direction of movement between two variables (assets) (i.e. are they moving in the same direction at the same time, or in opposite directions at the same time). If the correlation coefficient is 1, there is a perfect linear relationship between the independent and dependent variables, they are moving in the same direction at the same time and the relationship is direct. Conversely, if the correlation coefficient is -1, there is a direct but inverse relationship between the independent and dependent variables, they are moving in opposite directions at the same time.

COVARIANCE

Covariance is a measure of the timing, direction, and magnitude of the fluctuations of two independent variables. The measure of diversification in a portfolio is determined by the negative covariance of the assets in relation to each other. Effective diversification is achieved when the assets do not fluctuate in a similar manner, so that the variability of the expected rates of return for the portfolio will be less than the variability of individual components of the portfolio. The covariance is a product of the standard deviations of the variables times the coefficient of correlation.

EFFICIENT FRONTIER CURVE

The Efficient Frontier and Capital Market Lines are displayed which the user may use in constructing or evaluating alternative optimal portfolios. The efficient frontier is a line along which the proportional allocation of capital to a group of assets will provide the greatest rate of return commensurate with the degree of risk (standard deviation of the portfolio) exhibited by the portfolio. For every level of return which an investor expects to achieve there is a commensurate level of risk he must accept. The higher the risk, the greater the expected rate of portfolio return which can be identified at any point along the frontier.

EXPECTED MEAN RATE OF RETURN

The expected mean rate of return is the mean of the probable rates of return based on the distribution of the historical data. Therefore, the expected mean rate of return is the mean of the probability distribution of all monthly rates of return available for the period of time selected for each asset or fund.

MEAN RATE OF RETURN

The mean rate of return is equal to the sum of all period rates of return in the data population divided by the number of such observations.

LINEAR OPTIMIZATION

Linear optimization uses only one factor (returns) in calculating optimal portfolios. It is a form of simple regression which describes the way one variable (return) is related to another (correlation - the timing and direction of movement of the independent variable in relation to the dependent variable).

MARKET TIMING

Market timing is an attempt to maximize returns by moving capital into or out of the markets based on the timing of such moves. Using various technical and quantitative methods, investors try to time their investments of capital when the markets are moving up, and liquidate positions when the markets are declining, thereby maximizing gains and limiting losses.

MARKET (SURROGATE) INDEX

Where insufficient data is available for any asset, fund or security, a surrogate index (asset) may be substituted for that investment in preparation of portfolio recommendations. Surrogate indices may include indices such as the S&P 500 Index and the Soloman Brothers Broad Bond Index.

MAXIMIZE RATE OF RETURN - PERIOD

This is the period of time over which the client wishes to maximize returns, and minimum cash yields. The time period to maximize returns will generally be between 1 and 5 years. Based on the confidence level selected, there is a maximum rate of return within the probability distribution which may be expected for the period specified.

MINIMUM RETURN PERIOD

The Minimum Return Period represents the period over which minimum returns (risk) will be expected. The correct method of evaluating client risk as a quantitative measure of portfolio risk (loss of principal), it is

important for the adviser and the client to understand the amount of principal loss the client is willing to tolerate in any one year.

For example, the client's current portfolio exhibits a downside risk of -5%. If this exceeds his tolerance for risk of loss in any one year, then the minimum return period should be one year, and the minimum expected return should be from 0% (no loss in any one year) to less than -5%. If, however, the client has certain actuarial, funding or current income requirements, then the minimum return period might be five years and the minimum expected return might be slightly greater than the minimum required.

MODERN PORTFOLIO THEORY

Simply stated, it is the process of selecting a mix of asset classes and the efficient allocation of capital to those assets by matching rates of return to a specified and quantifiable tolerance for risk. Risk tolerance is essentially the percentage of an investment portfolio that an investor is willing to risk to achieve a specific rate of return. It is no longer a one-dimensional process of selecting the right stock, bond or property to place in a portfolio.

Modern portfolio theory and asset allocation methods have as their foundation four basic premises. First, that investors are inherently risk-averse. Second, that the markets are basically efficient. Third, that the focus of attention should be shifted away from individual securities analysis to consideration of portfolios as a whole predicated on explicit risk-reward parameters and on the identification and quantification of portfolio objectives. Fourth, is the optimality of portfolio returns vis-à-vis portfolio risk. In other words, for any level of risk that one is willing to accept, there is a rate of return that should be achieved. Quantitative methods are used for measuring risk and diversification, making it possible to create efficient and theoretically optimal portfolios.

OPTIMIZATION (ASSET ALLOCATION)

is the process of selecting a mix of asset classes and the efficient allocation of capital to those assets by matching rates of return to a specified and quantifiable tolerance for risk. It is no longer a one-dimensional process of selecting the right stock, bond or property to place in a portfolio.

PROBABILITY RANGE

The Probability Range is a function of the probability of achieving a range of expected returns. In any statistical population (or sample) 68.3% of all observations will be included within one standard deviation from the mean; 95.4% of all observations within two standard deviations; and 99.7% of all observations within three standard deviations. Therefore, at the 90% confidence level (slightly less than 2 standard deviations) one would expect 90% of all observations or expected observations to fall within the minimum and maximum rates of return of a probability distribution. The probability range (also referred to in statistics as the confidence level) essentially determines the percent of all expected rates of return which will be included within the expected minimum and maximum rates of return. In most cases the 90% level will be sufficient for evaluation.

QUADRATIC OPTIMIZATION

Risk and performance are not linear functions. One of the problems with statistical definitions of risk (relative to optimization models) is the use of linear analysis, which uses simplified assumptions and calculations. Better accuracy can be attained using non-linear or quadratic equations, which can model complex relationships. Quadratic optimizers use multiple factors (such as returns, correlations, covariances, taxes, and contributions to the portfolio) in determining the optimal mix of assets for each unit of risk (standard deviation) the investor is willing to assume. Using these calculations, non-linear investment performance can be analyzed and optimized.

RISK LEVEL - MINIMUM EXPECTED ROR

To express the client's tolerance for risk of loss you will generally enter 1 for the number of years followed by the percent of portfolio principal which the client may be willing to lose in any one year. If the client is not willing to lose anything, leave the Rate at 0.0%. If the client is willing to lose 2% of his principal in any one year, enter -2.0.

Based on the confidence level selected, there is a minimum rate of return within the probability distribution which may be expected. The 90% confidence level includes 90% of the probable rates of return within the distribution, the lowest of which will be the minimum rate of return.

RISK

The risk or volatility of any asset or portfolio is measured by the standard deviation in the distribution of rates of return of the asset or portfolio. The greater the positive or negative rate of return within one standard deviation,

the greater the risk. Depending on the time period being measured, the standard deviation reflects the variability of change in the asset.

RISK-FREE ASSET

The "risk-free" asset is an asset which has, theoretically, no risk or volatility. Assets in this regard might include Treasury Bills, money market instruments and CDs (under $100,000).

RISK-FREE RATE OF RETURN

The risk-free rate of return will either be a rate at which you could lend money to a risk-free asset such as a T-Bill, or a rate at which you can actually borrow money.

SIMPLE REGRESSION

Simple regression describes the way in which one variable is related to another. Regression analysis derives an equation which can be used to estimate the unknown value of one variable on the basis of the known value of the other variable.

STANDARD DEVIATION

The standard deviation is a measure of dispersion of observations expressed in the same units as the measurements (percent rate of return). Mathematically it is expressed as the positive square root of the mean of the squared deviations or squares of the values of measurement from their mean. One standard deviation will include 68.4% of all observations within a population dispersion. The wider the spread of measurements within one standard deviation, the greater the variability of the population (asset). Therefore, the greater the variability from the mean rate of return, the greater the risk inherent in the asset. The validity of correlating standard deviations among several asset classes will depend upon using the same time period of measurement. In general, assuming the same time period and unit of measurement is used, the greater the standard deviation of one asset in relation to another, the riskier the asset is in relation to the other.

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RETURNS

"If I cannot understand it then it must be wrong"
(anonymous source: from the dumbest quotes file)

Introduction

ICE calculates returns for user selected time horizons. A time horizon is a specified period, such as December 1986 through December 2001 and may represent a period which the user would like to focus. The returns computed will be initially from historical data and are a common horizon for the portfolio assets/securities selected. Calculation of a different time horizon may be computed at any point, if desired, in the future. The user may modify the returns to reflect estimates after the initial calculation. There are three different holding periods calculated - 1 year, 3 year, 5 year. Returns displayed are the rolling period mean rates of return.

Time Horizon

Time horizon is the specified historical period for calculating portfolio/asset returns, standard deviation, and correlation (i.e. 12/86 to 12/01). The time horizon will initially default to the longest common period for the assets/securities selected. A shorter period may be used but any change to the default time horizon must be between the beginning date and the ending date. Changing the historical time horizon allows the user to focus on a specific historical period, i.e. high inflation. A calculation of one historical period compared to another period will

result in different returns, standard deviation and correlation performance. The program does not perform "backward modeling" or estimating performance for an asset where there is no history, and the common time horizon allows appropriate measurement of how assets/securities would have statistically performed individually and combined during a given time horizon. All dates indicated are end of month.

Holding Period
The portfolio hold refers to the periods 1 year, 3 year, and 5 year average annualized returns. Each hold period will be computed for the user specified time horizon. If the time horizon is December 1986 to December 1996 then there are 120 months or ten years. In this time horizon there will be 108 twelve-month periods. The portfolio asset/security return will be calculated based of the average returns for each of the holding periods using all data points applicable to each hold period (i.e. 108 twelve month periods for the 1 year hold).

Each holding period computed will have average returns that may be higher or lower than other holds. Each hold, initially, will be based on the historical averages and each holding period may be used for concentration within the program for portfolio optimization, portfolio design, and or risk measurement.

ICE Portfolio Return Calculation
The mean is the calculation used in converting historical data to return estimates. The sum of all data points over a time horizon is divided by the number of data points.

Probability Range
The higher the probability range the wider the potential statistical returns may fall. A probability range of 90% will have a lower minimum and a higher maximum potential return than a probability range of 80%. The probability range multipliers are listed below and are used in conjunction with the standard deviation and expected returns to indicate the probability range of returns. The multiplier is equivalent to a range on the "bell curve" where the 90% range is 1.645 standard deviations.

68% 1 (1 times the standard deviation)
80% 1.282 (1.282 times the standard deviation)
90% 1.645 (1.645 times the standard deviation)
95% 1.960 (1.960 times the standard deviation)
99% 2.575 (2.575 times the standard deviation)

Minimum Return Goal
The minimum return goal is the portfolio risk tolerance level. A goal is the least expected return that is desired for a given holding period (i.e. 1, 3, 5 years). If the client desires that a portfolio achieve no less than -3% in the next twelve months, then the minimum return goal is -3% for 1-year. A minimum return goal will be inputted for the client if the fifteen question risk tolerance questionnaire is completed, this will be filled in under the default tab, and this may be modified for the client or one or more of the client portfolios. The minimum return (expected low end of the return range of the portfolio for the probability level) when computed for a portfolio will use the following:

exp. return - (std.)(probability range multiplier)
expected Return
expected Standard Deviation
Probability range
(higher probability ranges produce lower minimums)

Maximum Return
The maximum return is computed for the portfolio using the expected return, expected standard deviation and the probability range. The maximum return is the high end on the expected return range for the portfolio for the selected probability range.

User Estimate (Manual entry)
Any asset return may be overwritten with an expected, estimated, or forecasted return. The estimate will be used for the hold and the portfolio.

AdvisoryWorld Estimates (Edit Portfolio)
AdvisoryWorld supplies 1 year estimates for various asset classes. The estimates are based on the expected movement of the 90-day Treasury Bill estimate for the next twelve months and or expected yields for debt instruments. The expected 90-day Treasury Bill estimate is correlated over an historical time horizon to each of the assets for which a return estimate is computed. The return estimates are for the next twelve months and are updated monthly.

The AdvisoryWorld estimates may be applied to an individual asset or to all of the asset classes for a portfolio. The AdvisoryWorld estimates cannot be applied globally for all clients and or portfolios and when used for a portfolio will not affect any other portfolio.

Firm Estimates
If the program is part of a large group (broker/dealer has specified certain functionality for their representatives) then there may be firm defined estimates. The estimates may be applied to a single asset/security, Firm Estimates - Line, or globally for the portfolio, Firm Estimates - Global. Inserting the estimates for a portfolio will not change or use the estimates for another portfolio or any other client. Firm estimates may be viewed (estimates cannot be modified).

Cumulative Return
Cumulative return is the total return over a specified time horizon. This is also known as the holding period return. The ICE program illustrates the portfolio cumulative return both graphically (historical performance - dollar growth) and numerically (dollar growth table). The dollar growth table and graph both use a base of one. The graph removes the base when illustrating the cumulative return and the table will grow with base included. Returns are nominal and are not reduced by taxes, management fees, and or inflation.

Annualized Return
The annualized return is computed by adding one to the cumulative return and raising the number to the power of 12/number of holding months. The annualized return is the equivalent of the 12-month compounded return.

Average Return
The average returns reflects the mean of the data points. Computed average monthly data points and average holding periods (1,3,5) returns. The average calculation sums all of the data points and divides by the number of data points. Returns are nominal and are not reduced by taxes, management fees, and or inflation.

Median Return
The median return is the return of a data series which has the same number of data points below and above. Example: if there are eleven data points (returns) the median return would be data point number six if the returns were in sequential order (i.e. highest to lowest). Returns are nominal and are not reduced by taxes, management fees, and or inflation.

Monthly Return
Monthly return is the percent change from the prior month. The return change will be either total return, income and capital appreciation/depreciation, or based on price movement only. Indices with (UA) next to the name represent asset classes with returns based only on price movement or unadjusted returns for income. The AdvisoryWorld Databases, unless specifically noted, contain historical month-to-month return changes. The month-to-month return performance allows the user flexibility to calculate for a desired time horizon both for expected and past performance review. Returns are nominal and are not reduced by taxes, management fees, and or inflation.

High Growth (Historical Dollar Graph)
Represents the highest return (cumulative) during the time horizon indicated. This will usually be equivalent to the cumulative return but there may be time horizons where the cumulative return prior to the end of the time horizon was greater than the ending cumulative return.

Low Growth (Historical Dollar Graph)
Represents the absolute lowest return (cumulative) during the time horizon indicated. This will generally be equivalent to zero, but there will be time horizons where the cumulative return will fall below zero.

Thank you for using AdvisoryWorld's financial applications and services. We are constantly striving to design and build better programs to make your job easier and more productive.

If you have any comments or suggestions, please do not hesitate to call us at any time.

For technical support, please call:
(818) 999-0015